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ABSTRACT

Intended for teachers of junior and senior high school students, the document outlines a course on the prevention of mental retardation through education of future parents. Introductory matter suggests that the teacher take 15 classes to cover the material. Lessons are organized into seven major areas: introduction to mental retardation and responsibilities of the teenager, woman and man, woman and man planning for a child, pregnant woman and father, woman in labor and birth and the father, and mother and father of the newborn. Information on each lesson includes the following: objectives, a pretest to test the knowledge and attitudes of students before the lesson, background information for the teacher, an outline of the mini-lecture presentation for the students, classroom experience options, outside classroom experience options, an action checklist, a posttest, and selected references. Masters for dittos and transparancies and lists of community and state agencies, government agencies, audiovisuals, and directories are also given. (SBH)

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TOWARDS ⇨ THE PREVENTION OF MENTAL RETARDATION IN THE NEXT GENERATION

VOLUME 1

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TOWARDS ⇨ THE PREVENTION
OF
MENTAL RETARDATION
IN
THE NEXT GENERATION

A HEALTH EDUCATION CURRICULUM: COURSE OF STUDY-RESOURCE MANUAL

for Junior and Senior High School Students

"The BEST WAY To Deal With Mental Retardation is TO PREVENT it from occurring."

PREVENTION

FOREWORD

Dr. Burton Blatt, past president of the American Association on Mental Deficiency, has referred to many of our past programs on the behalf of the mentally retarded as "empty revolutions". He levels his criticism at those who embark on "oratorical crusades" rather than on action.

The present project, which you as educators will implement, is not mere empty rhetoric but action at the grass roots level. The goal of preventing mental retardation is realistic and attainable. The methodology and technology is presently available to markedly reduce the incidence of mental retardation. We need not await great scientific achievements.

Accomplishment of our goal will depend on your abilities in two areas. On the one hand you will have to be effective health educators. This means your students must know the facts about what causes mental retardation and what knowledge and available resources are necessary to act upon those facts.

Secondly, and most importantly, you must instill in your students a sense of responsibility for their own health and the health of their unborn children. This will be your most difficult task, but it is the bottom line of the whole project. Belief and knowledge without action will be another "empty revolution". Arm them with the facts, but as well instill within your students the spirit to fight for the right of their children to be well-born.

Dr. Jeffrey Alexander
Chief of Pediatrics
Riley Child Development Center

Basic health teachers, home economic teachers, special education teachers and school nurses in junior and senior high schools can play a crucial role in reducing the number of handicapped children who are born each year.

According to the President's Panel on Mental Retardation it is estimated that more than 60,000 mentally retarded infants will be born in the United States this year, 2,500 of whom may be Indiana residents.

Each of these infants will bring untold hardship and heartbreak to their families in addition to frequent financial burden. This life of hardship for some retarded individuals and their families need not be for we now have the knowledge and technology to cut the incidence of mental retardation in half.

The involvement of teachers and school nurses is crucial because little progress will be made in the prevention of mental retardation and other handicaps unless "parents to be" are systematically educated and made aware of the knowledge already known and specific methods of prevention. There are few things more important than to bring into the world children who are as physically and mentally perfect as our present knowledge permits.

Schools are in a better position than any other agency to systematically get the information to persons who need it i.e. young people who are likely to become parents in this decade.

According to my sources and inquiries this course of study-resource manual represents the most unique, comprehensive and thorough guide in the preventable causes of mental retardation in this country. This guide can have a profound effect on reducing the prevalence of mental retardation and other handicaps, but to have that effect IT MUST BE USED.

If this course of study sits on the bookshelf, there will be some children born with birth defects and handicaps who could have been "born well".

Bob Robertson
Special Education Consultant
State Department of Public
Instruction

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INTRODUCTION TO THE COURSE OF STUDY

I. WHY PREVENTION EDUCATION FOR THE JUNIOR AND SENIOR HIGH SCHOOL STUDENT?

The Problem: In the time that it takes you to read this introduction, ten children will be born in the United States who are mentally retarded. Saying the same thing in a variety of ways:

- 3 out of every 100 babies born are mentally retarded or become so thru illness or injury before maturity.
- 6 million Americans are mentally retarded.
- 3% of all births are added to the ranks of the mentally retarded each year.
- Every 2 minutes in the United States a child is born mentally retarded.
- One out of every 16 babies are born with a birth defect.
- More than 60,000 mentally retarded children will be born this year. 2,500 of these will be in Indiana. One fourth of these will be severely retarded.
- At present rates some 4 million of our children are expected to be born by the year 2000 who will be retarded or become retarded.
- One out of every ten persons in this country has a mentally retarded person in his immediate family.
- 700 babies born each day are mentally retarded.
- Mental retardation effects the daily lives of 15 million Americans.
- More than 60,000 persons of all ages die each year as a result of birth defects.
- Each year 1.2 million infants, children and adults are hospitalized for treatment due to birth defects.
- A half million unborn babies are destroyed each year by miscarriage, and still births resulting from faulty fetal development.

- HOWEVER, 30,000 NEEDLESSLY RETARDED CHILDREN ARE BORN EACH YEAR.

The facts are staggering. The great number of normal pregnancies, 9 out of 10, obscure the need for focusing special attention on the fact that it is the humanistic and economic responsibility of parents and society to bring infants into the world as perfect as our present knowledge permits.

Birth defects are the second greatest destroyer of life in the United States outranked only by heart disease and greater than cancer and stroke combined. Americans have never made preventive health care a national priority. Our neglect shows in maternal and infant death rates which are among the highest in the western world. We do a poorer job than fourteen other countries regardless of our wealth and technology. Mental retardation is a major social, educational, health and economic problem. It creates enormous problems for public health, educational, welfare and vocational services. It is the most frequent cause of a lasting and often lifelong handicap.

Socially and economically the costs of mental retardation are monumental. The anguish, disappointment, grief, worry, guilt and damage to self esteem of parents of retarded children can be devastating and for the most part their feelings remain untold. To the average parent the birth of a retarded child may be a trauma never fully overcome. Often the care and cost of raising a retarded child greatly strains family and marital relationships and puts a drain on parental energies. The human misery, shattered lives, desolation and lack of freedom to live a full life for the retarded themselves is perhaps the greatest tragedy of all.

The financial drain on the family of a mentally retarded child is considerable. It may include the cost of residential placement, medical diagnosis and treatment, special education costs, rehabilitation programs, cost of residential placement and lifelong support. The cost to society as a whole is also great. The average cost in an Indiana residential facility for caring for one retarded child is from $16,000 to $18,000 a year or $1,260,000 for a life span of 70 years and these costs continue to rise. Said in other ways

- The estimated cost to this nation is 8.7 billion annually in lost lifetime earnings of the retarded.
- Each mentally retarded citizen will cost society $650,000: the money he might have earned during an average lifetime.
- Direct costs to the taxpayer in support of schools, residential institutions and related specialized services amounts to more than one and a half billion per year. This does not include costs borne by the retarded individual's family.

- Welfare and social security payments to the retarded exceed 400 million annually.

- The federal government grants 425 million each year to research concerning mental retardation which is matched by state, local and private funds.

The Challenge: In 1961 the President's Panel on Mental Retardation challenged the people of this country. It said "that the reduction of the occurrence of mental retardation by 50% was possible before the year 2000 if we expand our knowledge and fully and vigorously apply the existing technology, methodology and knowledge on prevention of mental retardation at the rate at which we have done in the past twenty-five years, both in specific preventive measures and taking action on a broad front to correct adverse community conditions". The panel stressed that little progress will be made in prevention unless the public and professionals are educated (versus a closed professional group in the field of mental retardation) and made aware of knowledge already known in the methods of prevention and their role in those methods. The frequency of occurrence of mental retardation continues to rise because of greater expertise and sophistication in diagnosis and the recovery of those who without advanced medical technology would have died. However, the number of prevention techniques has also risen.

It is impossible to collect data on the retardation which "might have been". Success has changed our outlook on mental retardation both in prevention and care. The stigma of hopelessness which has surrounded mental retardation for centuries is fading and there are new hopes for the future. Even though approximately 30% of the causes of mental retardation are unknown we need not delay prevention education programs until all the facts are known or all the "data" is in. Great strides have been made in known preventable causes of mental retardation in relation to nutrition, immunization, control and treatment of disease, genetic counseling, identification and treatment of inborn errors of metabolism, high risk pregnancy identification and care, early identification of learning problems, childhood accident prevention, intervention in abuse, harmful drug identification, improved birth alternatives and control of maternal illness. IF GROWING KNOWLEDGE OF PREVENTION WHICH IS BEING DISCOVERED LIES DORMANT WITHOUT VIGOROUS APPLICATION IT IS FUNCTIONALLY USELESS.

A Systematic Prevention Plan: Perhaps half of the cases each year in Indiana of mental retardation, 2,500 a year, could be prevented if present knowledge was communicated to "soon-to-be" parents in a way which would motivate them to do everything possible to prevent mental retardation in their child or children. Every boy and girl by child conceiving age should be knowledgeable in prevention of mental retardation methods. Young people are bearing children earlier in their lives. More than 600,000 children are born to teenage mothers and fathers each year. One out of every ten 18 year old girls have at least two children. It is important that we reach out with preventive information by the ninth grade. Since high school marks the end of formal education for many young people, junior and senior high presents the last universal opportunity for systematically reaching "potential parents-to-be" with all the present strategies available to insure that infants are brought into the world as physically and mentally perfect as present knowledge permits and continue their development in the best possible biological and environmental conditions.

One reason many women do not receive prenatal care is that our society has not systematically provided preconception, pregnancy, labor and delivery information. Each year a half million women fail to seek even the most basic care necessary to reduce the risks and increase their chances for a healthy delivery. Also, during the past several years an increasing number of young people have rejected established health care practices of our society and families to counteract hypocrisies on destructive elements of families and society. Young people have chosen a life style which excludes utilization of sound health practices that endangers the future of their children. Preparation for parenthood is rooted, forms and grows in what one's own home life and values are like. And so the development of a child does not begin the day a child is born but much earlier during his or her parents formative years. The creative challenge for the school is to interpret, deepen and extend that experience.

The Educator's Role in the Systematic Plan: The success of the prevention of mental retardation will depend on how effectively we as educators sell the preventive methods developed by the medical, biological and technological fields. We are the marketing agents. We must sell these methods to the consumer, the "parents-to be". We have almost every potential parent in the formative years as a captive audience in the junior and senior high schools of Indiana. The challenge is to develop in our students an aroused and positive consumer attitude towards the prevention of mental retardation. Given a choice NO parents would choose to have a defective child. As educators we value children. We are committed to them. By your face-to-face communication with your students, your interest in prevention and by choosing appropriate affect experiences for your class the children of your students may be born straight, healthy and bright.

WE CAN DO MORE to prevent the tragedy of mental retardation. The systematic use of this course of study will increase the probability that Indiana's future children are assured the right to be BORN WELL.

2. HOW TO USE THIS COURSE OF STUDY - RESOURCE MANUAL

a. Options for Number of Class Sessions

Because Towards ⇨ The Prevention of Mental Retardation In The Next Generation is only one of the many areas of study you might be using as an educator a course of study suited to the number of class sessions you can use to teach prevention of mental retardation can be "put together" in a variety of ways. To "cover" the material it is suggested you allow fifteen class sessions. However, you may need to choose a total of ten, five or two class sessions or you may want to spend a half of a semester or a semester on the prevention of mental retardation. There are enough materials and experiences provided to extend the course of study to a semester but it is also possible to give basic prevention techniques in a factual way in several class sessions.

Examples of putting a course of study together to fit your time limitations:

FOR	DO
2 class sessions	Read the background material for the teacher in units I through VII. Pass out the action checklists and go over the lists briefly hitting some high points in prevention.
5 class sessions	Read the teacher's background material for units I through VII. Use the action checklists to distribute in class hitting some high points in prevention. Use several audio-visual aids.
10 class sessions	Use the format suggested in the mini-lecture or presentation. Use one class session for the introduction to mental retardation and one and a half class sessions for the rest of the units.
15 class sessions	Use two class sessions for each unit of srudy adding at least one classroom experience option for each unit of study. Plan one outside classroom experience option.
1/4 to 1/2 semester	Use the format suggested in the mini-lecture of presentation. Use one or two audio visual aids suggested for each unit of study. Use at least one classroom and outside classroom experience option for each unit.

b. Code System

A simple code system is used throughout the curriculum guide to facilitate the understanding and organization of the course of study and for "putting together" each class session.

✎	Dittos and Transparencies
⬡	Community and State Agencies
⊜	Government Agencies
⊛	Audio-Visuals
▣	Directories
▷	Objectives
▭	Background Information for the Teacher
⇨	Pre and Post Tests
△	Mini-Lecture Presentation
□	Classroom Experience Options
⊡	Outside Classroom Experience Options
✓	Action Checklist
○○○	Selected References

c. The Format of Each Class Session or Area of Study

▷ Objectives

Broad, general objectives are stated for each class session as well as a number of specific cognitive and affective objectives. It is important for the teacher to know in a general way where he or she is going and what specific bits of knowledge (cognitive objectives) are expected to be learned by the students as well as how you hope to affect (affective objectives) their values and attitudes.

⇨ Pretest

A pretest is provided to test the knowledge and attitudes of the students before they are exposed to each area of study and its related experiences. The pretest technique is appealing to some teachers and the students know "what they don't know" and "where they are going". One technique is to have the students take it at the beginning and end of class either in the classroom or as outside work and let them compare their own gains.

▭ Background Information for The Teacher

Each of the seven areas of study contain background information for the teacher so that you will feel more confident in your presentation knowing that you have more information available than you are actually presenting to the student. To educate the teacher as to the prevention of mental retardation the background materials also allow you to adapt the content of the class session to the level of your students. The background information may be useful as a resource in answering questions that students may ask. Teachers should not feel uncomfortable in saying that they do not know the answer to a question or that they will try to find the answer.

△ Mini-Lecture Presentation for The Students

The mini-lecture presentation for the student focuses in a straight forward approach on:

1. Information on known causes of mental retardation which are now preventable in the next generation, and
2. What responsibility must be taken in each phase of a person's life cycle:

THE TEENAGER
THE WOMAN AND MAN
THE WOMAN AND MAN PLANNING FOR A CHILD
THE PREGNANT WOMAN AND THE FATHER
THE WOMAN IN LABOR AND BIRTH AND THE FATHER
THE MOTHER AND FATHER OF THE NEWBORN

Each phase of the life cycle covered is one area of study except THE INTRODUCTION TO MENTAL RETARDATION. The mini-lecture presentations cover the cognitive objectives of the area of study. These presentations are best given in your own words and embellished and made personal and alive by your own experiences and examples.

☐ Classroom Experience Options

Options for classroom experiences are given in each area of study for you to choose one or more experiences that suit your style, tastes, ease of arrangement and your classroom students. It may be more effective if you use a classroom experience option before you present the mini-lecture presentation. The experience could make the factual information have more impact and be more meaningful. Experience may often be of more value than any amount of lecturing. A number of specific classroom experience options are given in each area of study from one or more of the following general techniques:

1. Speakers
2. Demonstrations
3. Small, large or two's discussion groups
4. Interviewing
5. Debate
6. Role Playing
7. Letter Writing
8. Attitude Survey
9. Slides
10. Films
11. Filmstrip
12. Cassette Programs
13. Pamphlets & Booklets

Resource lists are provided in the introduction from which to order audio-visuals and pamphlets and to choose speakers, people to interview and people to write.

⊡ Outside Classroom Experience Options

Options for experiences outside of the classroom are given in each area of study for you to choose one or more experiences that are suited to you and your students. According to your time plan you may want to:

1. Use a classroom experience for one area of study and an outside experience for another area, or
2. You may want to use one from both classroom and outside experiences, or
3. Use more than one classroom and outside experience.

Experiences outside the classroom are very important in affecting attitudes, values and action. Therefore, specific outside class experience options are given in each area of study from one or more of the following general techniques:

1. Field Trips
2. Interviewing
3. Small group and one to one interaction
4. Group and individual projects

✓ Action Checklist

The Action Checklist is a call to some kind of cognitive and affective commitment to the prevention of mental retardation in each phase of the student's life cycle. It is the core, the purpose of this course of study - to trigger action. The Action Checklist should be dittoed or reproduced and handed out and explained with the students at the end of each area of study. It would be good to ditto these checklists on colored ditto paper to call attention to its importance. It should also be suggested that the checklist may be something that the students may want to save for future reference as potential parents and for brothers and sisters, relatives and friends.

⇨ Post Test

The post test is provided to test the knowledge and attitudes of the students after they are exposed to each area of study and related experiences. The post test technique helps the teacher know how effective they have been in facilitating learning and helps the student know what they have learned and how their attitudes and values have changed about the prevention of mental retardation.

○○○ Selected References

Selected references are listed following each area of study should the teacher or students be interested in further reading in the subject area.

d. Dittos and Transparencies

Information is provided on how to make dittos and transparencies from the masters given in each unit of study.

e. Master Resource Lists

Master Resource Lists of community and state agencies, government agencies, audio-visuals and directories are given so that you may obtain speakers, pamphlets and audio-visual material.

3. TWO FINAL SUGGESTIONS BEFORE YOU BEGIN

a. To form attitude development your students must:

- Personally feel and understand the seriousness of the possibility of mental retardation to his or her own potential children.

- Perceive that their possible children are susceptible to mental retardation.

- Perceive that they will reap benefits from the prevention of mental retardation in their potential child or children.

- Believe and understand that no coercive elements enter into a prevention program but that it is a choice through knowledge of alternative methods of the prevention of mental retardation.

- Feel that the methods of prevention are easily converted into action.

- Be positively and effectively influenced not in a preachy, moralistic or dogmatic way but in a factual, positive and enthusiastic approach that gives them the possibility of controlling their future through their own choices at various times of their life cycle.

b. To Plan Your Course of Study

- Decide on the number of days for your course of study.

- Select the parts of each area of study to be included for that time selection.

- Select classroom and outside classroom experiences you wish to use and make the necessary preparations to carry them out.

- Make dittos of action checklists and any other visual material you wish to reproduce such as pre and post tests, tables, illustrations.

- Order audio-visual material.

- Order pamphlets.

Dittos and Transparencies

1. To make DITTO MASTERS:

   a. Using a thermo-fax machine:
      1. Place Tear Out page from this manual flat on tissue.
      2. Place glossy purple sheet on top of tear out page.
      3. Place white paper on top of glossy purple sheet.
      4. Run the above stack through the thermo-fax with the dial set at the 4 o'clock position.
      5. You now have a ditto master.

   or

   b. Follow the directions with your thermo-fax machine.

   or

   c. Using a ball point pen:
      1. Lay Tear Out page on new ditto master.
      2. Paper clip these together.
      3. Go over all the lines and information on the tear out page with a ball point pen or typewriter.
      4. You now have a ditto master.

2. To make TRANSPARENCIES:

   a. Lay acetate sheet (transparency film) on top of the tear out page.

   b. Run the above stack thru the thermo-fax machine with the dial set at the 9 o'clock setting.

   c. You now have a transparency.

AGENCIES: Community and State

1. Alcoholics Anonymous World Services
Box 459
Grand Central Station
New York, N.Y. 10017

2. AL-NON Family Group
617 People's Bank
Indianapolis, Indiana 46204

3. American College of Home Obstetrics
664 North Michigan Ave.
Suite 600
Chicago, Illinois 60611

4. American Diabetes Association
18 E. 48th St.
New York, N.Y. 10017

5. American Dietetic Association
Publications Dept.
430 North Michigan Ave.
Chicago, Illinois 60611

6. American Medical Association Publications
Order Unit
535 N. Dearborn St.
Chicago, Illinois 60610 (cost)

7. American Society for Psychoprophylaxis
in Obstetrics (ASPO)
National Headquarters
1523 L St., N.W. Room 105
Washington, D.C. 20005

8. Dairy Council of Northern Indiana, Inc.
501 N. Main St.
South Bend, Indiana 46601

Covering the counties of:

Adams
Allen
Benton
Carroll
Cass
Dekalb
Elkhart
Fulton
Huntington
Jasper
Kosciusko
Lagrange
LaPorte
Marshall
Miami
Newton
Noble
Porter
Pulaski
St. Joseph
Starke
Steuben
Wabash
Wells
White
Whitley

Agencies (continued)

9. Dairy Council, Inc.
50 South Parder Ave.
Indianapolis, Indiana 46201

Covering the counties of:

Bartholomew
Blackford
Boone
Brown
Clay
Clinton
Decatur
Delaware
Fayette
Fountain
Franklin
Grant
Greene
Hamilton
Hancock
Hendricks
Henry
Howard
Jackson
Jay
Jefferson
Jennings
Johnson
Lawrence
Madison
Marion
Monroe
Montgomery
Morgan
Ohio
Owen
Parke
Putnam
Randolph
Ripley
Rush
Scott
Shelby
Sullivan
Switzerland
Tippecanoe
Tipton
Union
Vermillion
Vigo
Warren
Wayne

10. Dairy and Food Nutrition Council
of the Southeast, Inc.
Mid-South Division
1300 East Morgan Ave.
Evansville, Indiana 47711

Covering the counties of:

Clark
Crawford
Daviess
Dubois
Floyd
Gibson
Harrison
Knox
Martin
Orange
Perry
Pike
Posey
Spencer
Vanderburgh
Warrick
Washington

11. The Milk Foundation, Inc.
150 North Wacker Dr.
Suite 1234
Chicago, Illinois 60606

Covering the county of:
Lake

Agencies (continued)

IND-Indiana, North District
1507 Portage Ave.
South Bend, 46616
(219) 282-1611

ISD-Indiana, South District
148 E. Spring St.
New Albany, 47150
(812) 945-0227

LCC-Lake County Chapter
916 Aetna St.
Gary, 46403
(219) 938-6250

SC-Sagamore Chapter
2705 Bonny Ln.
Lafayette, 47904
(219) 447-9168

MCC-Madison County Chapter
522 Citizens Bank Building
Anderson, 46016
(317) 643-4343

NEIC-Northeastern Ind. Chapter
1010 Memorial Way
Fort Wayne, 46805
(219) 484-0622

OCT-Octabe Chapter
R.R.3, Grassland Hills
Jasper, 47546
(812) 482-6512

VCC-Vanderburgh County Chapter
1146 Adams Ave.
Evansville, 47714
(812) 423-1144

Region 9 (Ind. Ill. Iowa & Nebraska)
53 W. Jackson Blvd. 15th Fl.
Chicago, Illinois 60604
(312) 341-1370

Agencies (continued)

12. The Dairy Council of Cincinnati
Holiday Park
Randall Building, Suite 214
801 W. 8th St.
Cincinnati, Ohio 45203

Covering the county of:

Dearborn

13. Diabetes Association
1433 North Meridian St.
Indianapolis, Indiana 46202

14. ERIC Document Reproduction
P.O. Box 190
Arlington, Virginia 22210

15. Eunice Kennedy Shriver Center
200 Trapelo Rd.
Waltham, Mass. 02154
Tel. 617-893-3500 Ext. 218

16. Holistic Childbirth Institute
1627 Tenth Ave.
San Francisco, California 94122

17. International Childbirth Education Association
P.O. Box 5852
Milwaukee, Wisconsin 53220

18. LaLeche League International, Inc.
9616 Minneapolis Ave.
Franklin Park, Illinois 60131

19. Lead Industries Association, Inc.
292 Madison Ave.
New York, N.Y. 10017

20. March of Dimes in Indiana

CIC-Central Ind. Chapter
5235 N. Winthrop Ave.
Indianapolis, 46220
(317) 283-1358

ICD-Indiana, Central District
3728 N. Shadeland Ave.
Indianapolis, 46226
(317) 547-5293

Agencies (continued)

March of Dimes in Indiana (continued)

County	Office	County	Office
Adams	IND	Lawrence	ISD
Allen	NEIC	Madison	ICD
Bartholomew	ISD	Marion	CIC
Benton	SC	Marshall	IND
Blackford	ICD	Martin	OCT
Boone	CIC	Miami	IND
Brown	ISD	Monroe	ISD
Carroll	SC	Montgomery	SC
Cass	IND	Morgan	CIC
Clark	ISD	Newton	IND
Clay	ISD	Noble	IND
Clinton	SC	Ohio	ISD
Crawford	OCT	Orange	OCT
Daviess	ISD	Owen	ISC
Dearborn	ISD	Parke	ICD
Decatur	ICD	Perry	OCT
DeKalb	IND	Pike	OCT
Delaware	ICD	Porter	IND
DuBois	OCT	Posey	ISD
Elkhart	IND	Pulaski	IND
Fayette	ICD	Putnam	ICD
Floyd	ISD	Randolph	ICD
Fountain	SC	Ripley	ISD
Franklin	ICD	Rush	ICD
Fulton	IND	St. Joseph	IND
Gibson	ISD	Scott	ISD
Grant	ICD	Shelby	ICD
Greene	ISD	Spencer	OCT
Hamilton	CIC	Starke	IND
Hancock	CIC	Steuben	IND
Harrison	ISD	Sullivan	ISD
Hendricks	CIC	Switzerland	ISD
Henry	ICD	Tippecanoe	SC
Howard	IND	Tipton	ICD
Huntington	NEIC	Union	ICD
Jackson	ISC	Vanderburgh	VCC
Jasper	IND	Vermillion	ICD
Jay	ICD	Vigo	ISD
Jefferson	ISD	Wabash	IND
Jennings	ISD	Warren	SC
Johnson	CIC	Warrick	OCT
Knox	ISD	Washington	ISD
Kosciusko	IND	Wayne	ICD
LaGrange	IND	Wells	NEIC
Lake	LCC	White	IND
LaPorte	IND	Whitley	NEIC

Agencies (continued)

21. Massachusetts Association for Retarded Citizens
381 Elliot Street
Newton Upper Falls
Massachusetts 02165

22. Mental Retardation Agencies in Alphabetical Order by City

NOBLE COUNTY ASSOCIATION FOR RETARDED CITIZENS
205 East Highland, Albion 46701
(219) 636-2155

MADISON COUNTY ASSOCIATION FOR RETARDED CITIZENS
P.O. Box 31, Anderson 46015
(317) 642-0201

COMMUNITY SHELTERED WORKSHOP OF STEUBEN COUNTY, INC.
502 Weatherhead St., P.O. Box 57, Angola 46703
(219) 665-9408

FOUNTAIN COUNTY
The Shawnee Learning Center
R. R. 1, Box 245, Attica 47918
(317) 764-4000

SHAWNEE LEARNING CENTER
R. R. 4, Four miles south, One mile west, Attica 47918
(317) 764-4000

COMMUNITY PRESCHOOL FOR THE HANDICAPPED OF DEKALB COUNTY
Immaculate Conception Church, 500 East 7th
Auburn 46706, Mailing: Box 166, Auburn 46706
(219) 925-1612

BATESVILLE CENTER
West Pearl & Mulberry Sts. Batesville 47006
(812) 934-4528

LAWRENCE COUNTY ASSOCIATION FOR RETARDED CITIZENS
2140 Norton Lane, P.O. Box 528, Bedford 47421
(812) 279-3229

INDIANA UNIVERSITY DEVELOPMENTAL READING CENTER
2853 East 10th St., Bloomington 47401
(812) 337-6500

STONE BELT CENTER
2815 East 10th St., Bloomington 47401
(812) 332-2168

ADAMS-WELLS ASSOCIATION FOR RETARDED CITIZENS (NARC #1579)
R. R. 3, Bluffton 46714
(219) 565-3766

Agencies (continued)

SIRS ACTIVITY CENTER & WORKSHOP
Folsomville Road, R.R.3, Boonville 47601
(812) 897-4840

SIRS PRE-SCHOOL
St. John's United Church of Christ
North 6th Street, Boonville 47601
(812) 897-1441

AUX CHANDELLES
P.O. Box 398, East Jackson Boulevard, Bristol 46507
(219) 848-7451

CLAY COUNTY
Children's Learning and Adult Activity Center
800 West Jackson, Brazil 47834
(812) 448-1881

CLAY COUNTY LEARNING CENTER AND WORK ACTIVITY CENTER
Jackson Street School, Brazil 47834
(812) 443-2981

HELPING HAND PRE-SCHOOL
Muscatatuck State Hospital, Butlerville 47223
(812) 376-9404

MUSCATATUCK STATE HOSPITAL AND TRAINING CENTER
P.O. Box 77, Butlerville 47223
(812) 346-4401

HAMILTON INDUSTRIES
420 East Main Street, Carmel 46032
(317) 844-3100

SOUTHEASTERN INDIANA REHABILITATION CENTER
1329 Applegate Lane, Clarksville 47130
(812) 283-7908

WHITLEY COUNTY ASSOCIATION FOR THE RETARDED (NARC #1825)
445 South Line Street, Columbia City 46725

UNITED DEVELOPMENTAL SERVICES, INC.
1541 Hutchins Avenue, Columbus 47201
(812) 372-1259

STEPPING STONE SCHOOL
Asbury United Methodist Church
27th Street, Columbus 47201
(812) 372-8346

Agencies (continued)

OPPORTUNITY CENTER
1402 Hutchins, Columbus 47201
(812) 372-2806

OPPORTUNITY, INC.
DIVISION OF UNITED DEVELOPMENTAL SERVICES
1402 Hutchins Avenue, Box 721, Columbus 47201
(812) 372-2806

FAYETTE-UNION ASSOCIATION FOR RETARDED (NARC #1624)
420 West 24th Street, Connersville 47331
(317) 825-5188

F.A.T.E. CENTER
420 West 24th Street, Connersville 47331
(317) 825-5188

MONTGOMERY COUNTY PRE-SCHOOL
ROCK RIVER REHABILITATION CENTER
1306 East Main Street, Crawfordsville 47933
(317) 362-1724

DISABILITIES SERVICES, INC.
Room 206-8 Ben Hur Building, Crawfordsville 47933
(317) 362-4020

SOUTH DEVELOPMENTAL CENTER LAKE COUNTY ASSOCIATION FOR THE RETARDED
2150 West 125th Street, Crown Point 46307
(219) 769-3506

SIRS PRE-SCHOOL
ST. JOSEPH SCHOOL, Dale 47523
(812) 937-2621

HENDRICKS COUNTY ASSOCIATION FOR RETARDED CITIZENS (NARC #1585)
405 Lincoln Street, Danville 46122
(317) 745-4715

CARROLL COUNTY
Delphi Pre-School Class, Delphi 46923
(219) 583-8227

MARIAN DAY SCHOOL
625 Bellemeade Avenue, Evansville 47713
(812) 422-5346

HOPELAND TRAINING CENTER
2750 North Burkhardt Road, Evansville 47111
(812) 477-8689

VANDERBURGH DEVELOPMENT AND TRAINING CENTER
615 West Virginia Street, Evansville 47710
(812) 425-4585

SOUTHERN IND. REHABILITATION SERVICES
R.R. 2, Box 263, Industrial Park
West 9th Street, Ferdinand 47532
(812) 367-1883

STATE HOSPITALS AND TRAINING CENTERS FOR THE RETARDED AND DEVELOPMENTALLY DISABLED
Fort Wayne State Hospital and Training Center
801 East State Blvd., Fort Wayne 46805
(219) 485-7554

OPPORTUNITIES, INC.
2101 Fillmore Street, Fort Wayne 46804
(219) 432-1536

JOHNNY APPLESEED CENTER
2542 Thompson Avenue, Fort Wayne 46807
(219) 744-3324

CLINTON COUNTY ASSOCIATION FOR RETARDED CITIZENS (NARC #1570)
1059 McKinley Avenue, Frankfort 46041
(317) 659-3187

OPPORTUNITY CENTER PRE-SCHOOL AND SHELTERED WORKSHOP
1059 McKinley Avenue, Frankfort 46041
(317) 659-3187

GATEWAY LEARNING CENTER
214 South State Street, Franklin 46131
(317) 736-8476

WEE HAVEN WORK ACTIVITY CENTER
901 East Quincy, Box 233, Garrett 46738
(219) 357-4595

TRADE WINDS REHABILITATION CENTER, INC.
5901 West Seventh Avenue, Gary 46406
(219) 949-4000

NORTH DEVELOPMENTAL CENTER LAKE COUNTY ASSOCIATION FOR THE RETARDED
2660 West 35th Avenue, Gary 46408
(219) 884-0476

REHABILITATION CENTER OF METHODIST HOSPITAL OF GARY, INC.
600 Grant Street, Gary 46402
(219) 886-4566 or 886-4000

SHELTERED WORKSHOP AND TRAINING CENTER
2650 West 35th Avenue, Gary 46408
(219) 884-1138

SPECIAL PRESCHOOL OUTREACH AND TRAINING
Garnett Achievement Center, 2131 Jackson Street, Gary 46402
(219) 882-4566

PUTNAM COUNTY LEARNING CENTER
P.O. Box 504, 401 North Arlington, Greencastle 46135
(317) 653-4400

BRANDYWINE CENTER
802 North "A" Street, Greenfield 46140
(317) 462-4231

DECATUR TRAINING CENTER
Decatur County Fairgrounds, Greensburg 47240
(812) 663-4690

RAINBOW CENTER PRE-SCHOOL
Jerman Elementary School, Greensburg 47240
(812) 663-4110

THE VILLAGE CENTER
P.O. Box 1001, Huntington 46750
(219) 356-2490

NOBLE I
2400 North Tibbs Avenue, Indianapolis 46222
(317) 639-6271

NOBLE II
615 West 43rd Street, Indianapolis 46208
(317) 639-6271, Ext. 270

ST. MARY'S CHILD CENTER, INC.
311 North New Jersey Street, Indianapolis 46204
(317) 635-1491

CROSSROADS REHABILITATION CENTER, INC.
3242 Sutherland Avenue, Indianapolis 46205
(317) 924-3251

DAMAR HOME, INC.
6324 Kentucky Avenue, Indianapolis 46241
(317) 856-3134

MARION COUNTY ASSOCIATION FOR RETARDED CITIZENS SPECIAL SERVICES
2400 North Tibbs Avenue, Indianapolis 46222
(317) 639-6271

Agencies (continued)

MARK-ALPERN LEARNING CLINIC
8140 Spring Mill Road, Indianapolis 46260
(317) 259-1321

RILEY CHILD DEVELOPMENT CENTER
Indiana University Medical Center
1100 W. Michigan Street, Indianapolis 46202
(317) 264-8702

PATOKA VALLEY CENTER FOR DEVELOPMENTAL DISABILITIES, INC.
P.O. Box 123, Jasper 47546
(812) 482-2014

NEW HOPE CENTER WORKSHOP
725 Wall Street, P.O. Box 486, Jeffersonville 47130
(812) 288-8248

NEW HOPE SCHOOL
Highway 62, Charlestown 47111, (P.O. Box 486, Jeffersonville 47130)
(812) 256-5101

BONA VISTA DEVELOPMENT CENTER
1220 East Laguna Street, Kokomo 46901
(317) 457-8286

BONA VISTA WORKSHOP
1257 East Morgan Street, Kokomo 46901
(317) 457-5327

WABASH CENTER FOR THE MENTALLY RETARDED, INC.
2000 Greenbush Street, Lafayette 47904
(317) 742-1241

SCHOOL OF OPPORTUNITY
Box 192, Lagrange 46761
(219) 463-2653

LAWRENCEBURG CENTER
Dorman & Wayne Avenues, Lawrenceburg 47025
(812) 537-0110

COMMUNITY MENTAL HEALTH MENTAL RETARDATION CENTER, INC.
285 Bielby Road, Lawrenceburg 47025
(812) 537-1302

DEARBORN-OHIO ASSOCIATION FOR RETARDED CHILDREN (NARC #1625)
Developmental Disabilities Pre-School
Community Mental Health Mental Retardation Center
(also serves Franklin, Ohio, Ripley and Switzerland Counties.)
285 Bielby Road, Lawrenceburg 47025
(812) 537-1302

Agencies (continued)

MAINSTREET ENTERPRISES
Boone Developmental Pre-School
915 West Main, Lebanon 46052
(317) 482-0051

JEFFERSON-SWITZERLAND COUNTIES ASSOCIATION FOR RETARDED CHILDREN (NARC #1587)
c/o Special Services Unit,
Madison State Hospital, Madison 47250
(812) 273-5923

OPPORTUNITY INDUSTRIES
GRANT-BLACKFORD MENTAL RETARDATION, INC.
2715 South Western Avenue, Marion 46952
(317) 664-6229

MORGAN COUNTY REHABILITATION SERVICES
P.O. Box 384, Martinsville 46151
(317) 342-5538

PRESCHOOL DEVELOPMENTAL CENTER
190 West Mitchell Avenue, Martinsville 46151
(317) 342-7444

PARENTS COUNCIL FOR HANDICAPPED AND RETARDED CHILDREN
OF LAPORTE COUNTY (NARC #1702)
3200 South Cleveland Avenue, Michigan City 46360
(219) 872-6996

THERAPY CENTER FOR HANDICAPPED AND RETARDED CHILDREN
OF LAPORTE COUNTY
3200 South Cleveland Avenue, Michigan City 46360
(219) 872-6996

LAPORTE COUNTY SHELTERED WORKSHOP, INC.
4315 East Michigan Blvd., Michigan City 46360
(219) 874-4288

COMPREHENSIVE DEVELOPMENT CENTERS, INC.
900 West Norway Rd., Monticello 47960
(219) 583-8227

WHITE COUNTY
Comprehensive Development Centers
900 West Norway Road, P.O. Box 40, Monticello 47960
(219) 583-8227

DELAWARE COUNTY ASSOCIATION FOR RETARDED CITIZENS (NARC #214)
114 East Streeter, Muncie 47303
(317) 288-5503

Agencies (continued)

HILLCROFT CENTER
114 East Streeter, Muncie 47303
(317) 288-5503

ISANOGEL CENTER
R.R. 6, Box 195, Muncie 47302
(317) 288-1073

CANNON INDUSTRIES
114 East Streeter, P.O. Box 848, Muncie 47305
(317) 284-3315

BROWN PRE-SCHOOL
County Extension Office Bldg., Nashville 47448
(317) 988-6716

FLOYD COUNTY COUNCIL FOR THE RETARDED (NARC #1713)
2520 Shrader Avenue, New Albany 47150
(812) 945-2353

SILVERCREST DISABILITY AND CHRONIC DISEASE FACILITY
Old Vincennes Road, P.O. Box 500, New Albany 47150
(812) 945-5287

HENRY COUNTY ASSOCIATION FOR RETARDED CITIZENS
1343 South 14th Street, New Castle 47362
(317) 529-3331

HAMILTON COUNTY ASSOCIATION FOR SPECIAL CITIZENS (NARC #1676)
836 Cherry Street, P.O. Box 361, Noblesville 46060
(317) 773-8781

STEP BY STEP PRESCHOOL
779 North 11th Street, Noblesville 46060
(317) 773-1310

JENNING COUNTY TRAINING CENTER
O & M West Avenue, North Vernon 47265
(812) 346-4443

PIKE COUNTY PRE-SCHOOL
Otwell, 47564
(812) 758-2275

HARRISON COUNTY COUNCIL FOR RETARDED CITIZENS (NARC #1610)
Box 206, Palmyra 47164
(812) 364-6821

FIRST CHANCE CENTER
Box 143, Paoli 47454
(812) 723-3025

Agencies (continued)

GATEWAY CENTER
211 Gateway Drive, Peru 46970
(317) 473-6744

PIKE INDUSTRIES
607 South 7th, Petersburg 47567
(812) 354-6560

MARSHALL-STARKE ADULT SERVICES
1935 Western Avenue, Plymouth 46563
(219) 936-9400

JAYLAND RETARDED SERVICES, INC.
901 East Water Street, Portland 47371
(317) 726-7931

WORK TRAINING CENTER
GIBSON COUNTY ASSOCIATION FOR RETARDED CITIZENS
Corner of Prince and Pinkney Streets, Princeton 47670
(812) 386-6654

KRISSY KAY PRESCHOOL
West Spruce Street, Princeton 47670
(812) 385-4968

JASPER COUNTY
Jordan Center, Rensselaer 47978
(219) 866-3282

GREEN ACRES CENTER
800 Mendelson Drive, Richmond 47374
(317) 966-0502

MANITOU TRAINING CENTER
East 18th Street, Rochester 46975
(219) 223-6963

CHILD ADULT RETARDATION SERVICES, INC.
Box 96, South Jefferson Street, Rockville 47872
(317) 569-2076

PARKE COUNTY WORKSHOP
End of South Jefferson, Rockville 47872
(317) 569-2076

PARKE COUNTY LEARNING CENTER
602 Howard Avenue, Rockville 47872
(317) 569-6650

Agencies (continued)

PARKE COUNTY LEARNING CENTER AND WORK ACTIVITY CENTER
Box 96, Howard Avenue, Rockville 47872
(317) 569-6650

MCGRAW CENTER
204 North Julian, Rushville 46173
(317) 938-5321 or 825-5188

LEE J. FULTZ SCHOOL
P.O. Box 297, North Harrison Street, Salem 47167
(812) 883-2571

JACKSON TRAINING CENTER
First Avenue, Freeman Field, Seymour 47274
(812) 522-7676

SUNSHINE SCHOOL
321 East 16th Street, Seymour 47274
(812) 522-6996

SHARES, INC.
157 E. Broadway Street, Shelbyville 46176
(317) 835-4198

CORVILLA, INC.
18443 Bulla Road, South Bend 46637
(219) 272-5620

COUNCIL FOR THE RETARDED OF ST. JOSEPH COUNTY, INC.
P.O. Box 1049, 1235 North Eddy Street, South Bend 46624
(219) 289-4831

NORTHERN INDIANA STATE HOSPITAL AND DEVELOPMENT DISABILITIES CENTER
1234 North Notre Dame Avenue, South Bend 46622
(219) 234-2101

LOGAN INDUSTRIES VOCATIONAL SERVICES DIVISION
COUNCIL FOR THE RETARDED OF ST. JOSEPH COUNTY, INC.
1108 South High Street, P.O. Box 1049, South Bend 46624
(219) 289-5589

NEW HOPE SCHOOL
501 North Hartley Street, Sullivan 47882
(812) 268-6803

GREENE COUNTY ACHIEVEMENT CENTER
Box 136 (off Highway 54), Switz City 47465
(812) 659-2396

Agencies (continued)

TELL CITY WORKSHOP (PERRY COUNTY)
435 Main Street, P.O. Box 285, Tell City 47586
(812) 547-7009

SOUTHERN INDIANA RETARDATION SERVICES, INC.
P.O. Box 285, 435 Main Street, Tell City 47586
(812) 897-4840

CHILDREN'S LEARNING CENTER
KATHERINE HAMILTON MENTAL HEALTH CENTER
101 South 12th Street, Terre Haute 47807
(812) 238-2402

INDIANA STATE UNIVERSITY SPECIAL EDUCATION DEPARTMENT
Terre Haute 47809
(812) 232-6311, Ext. 2216 or 2364

VIGO COUNTY ASSOCIATION FOR RETARDED CITIZENS (NARC #1714)
101 South 12th Street, Terre Haute 47807
(812) 235-6376

TIPTON COUNTY ASSOCIATION FOR RETARDED CITIZENS (NARC #1862)
214 East Jefferson, Tipton 46072
(317) 675-6437

PORTER COUNTY ASSOCIATION FOR RETARDED CITIZENS (NARC #1591)
706 Ransom Road, Valparaiso 46383
(219) 462-7660

KCARC PRESCHOOL
Contact Knox County Association for Retarded Citizens
P.O. Box 334, Vincennes 47591
(812) 886-4312

WORKSHOP ENTERPRISES
P.O. Box 400, 421 West Canal Street, Wabash 46992
(219) 536-7115

WEE-HAVEN PRESCHOOL
P.O. Box 400, Wabash 46992
(219) 563-7115

CARDINAL INDUSTRIAL WORKSHOP AND TRAINING CENTER
504 North Bay Drive, Warsaw 46508
(219) 267-3823

WHITLEY COUNTY ASSOCIATION FOR THE RETARDED, INC.
504 North Bay Drive, Warsaw 46580
(219) 267-3823 or (219) 244-6695

Agencies (continued)

THE RED DOOR
1412 Memorial Ave., Washington 47501
(812) 254-4471

ROSEMARY KENNEDY
1412 Memorial Ave., Washington 47501
(812) 254-4471

PULASKI ASSOCIATION FOR RETARDED CITIZENS
R.R.2, Highway 35 South, Winamac 46996
(219) 946-3621

RANDOLPH COUNTY DEVELOPMENTAL CENTER
Don E. Starr, Director
R.R.2, Box 12A, Winchester 47394
(317) 584-1197

23. Metropolitan Life Insurance Company
347 W. Wayne St.
Fort Wayne, Indiana 46802

24. National Association of Parents and Professionals
for Safe Alternatives in Childbirth (NAPSAC)
David and Lee Stewart
P.O. Box 1307
Chapel Hill, North Carolina 27514

25. National Association for Retarded Citizens Publications
2709 Avenue East
P.O. Box 6109
Arlington, Texas 76011

26. National Catholic Educational Association
One Dupont Circle
Suite 350
Washington, D.C. 20036

27. National Foundation/March of Dimes
Publications, Films and Exhibits
Box 2000
White Plains, New York 10602

28. National Institute of Health and Human Development
National Institute of Health
Bethesda, Maryland 20014

29. Nutrition Foundation Inc.
888 Seventeenth St., N.W.
Washington, D.C. 20006

Agencies (continued)

30. The National PTA
700 North Rush St.
Chicago, Illinois 60611

31. PUBLIC HEALTH CLINICS, State of Indiana

Bartholomew Co. Health Dept.
2402 East 17th St.
Columbus, Indiana 47201
(812) 372-8847

Elkhart County Health Dept.
Courts Building Annex
315 S. Second St.
Elkhart, Indiana 46514
(219) 294-1688 ext. 272

Evansville-Vanderburgh
Health Department
City-County Bldg., Rm. 127
Evansville, Indiana 47771
(812) 426-5683

Fort Wayne-Allen County
Health Department
City-County Bldg., 5th Floor
Fort Wayne, Indiana 46802
(219) 423-7504

Gary City Health Dept.
1145 West 5th Ave.
Gary, Indiana 46402
(219) 944-6681

Hammond City Health Dept.
5925 Calumet Ave.
Hammond, Indiana 46320
(219) 853-6358

Henry Co. Health Dept.
1515 N. Memorial Dr.
New Castle, Indiana 47362
(317) 529-9011

Indianapolis-Marion Co.
Health Department
Bell-Flower Clinic
1101 W. 10th St.
Indianapolis, Indiana 46202
(317) 630-7192

Agencies (continued)

Public Health Clinics, State of Indiana (continued)

Madison Co. Health Dept.
Madison Co. Government Center
Anderson, Indiana 46016
(317) 646-9248

St. Joseph Co. Health Dept.
County-City Building 9th Floor
South Bend, Indiana 46601
(219) 284-9781

Vigo Co. Health Dept.
120 South 7th St.
Terre Haute, Indiana 47801
(812) 232-1585

Wayne Co. Health Dept.
15 N. 10th St.
Richmond, Indiana 47574
(317) 962-6324

White Co. Health Dept.
Courthouse
Monticello, Indiana

GOVERNMENT AGENCIES

1. Federal Food and Drug Administration
   Region V: 175 W. Jackson Blvd.
   Room A-1945
   Chicago, Illinois 60604
   Telephone: 312-353-1046
   also
   1222 P.O. Bldg.
   433 W. Van Buren Street
   Chicago, Illinois 60607

   Field Offices:

   Evansville, Indiana 47708
   101 N. W. 7th Street
   Rm. 233 FOB
   Telephone: 812-423-6282

   Ft. Wayne, Indiana 46802
   203 E. Berry Street
   Suite 1318
   Telephone: 219-422-6169

   South Bend, Indiana 46601
   125 S. Lafayette Blvd.
   226 Law Bldg.
   Telephone: 219-234-8111

   U.S. Dept. of HEW
   Public Health Service
   Food & Drug Administration
   5600 Fishers Lane
   Rockville, Maryland 20852

2. Consumer Information Center
   Federal Publications
   Pueblo, Colorado 81009
   (fee)

3. The President's Committee on Mental Retardation
   DHEW, ROB, 7th and D Sts., NW
   Washington, D.C. 20201

4. President's Commission on the Handicapped
   1111-20th Street, NW
   Washington, D.C. 20036

5. U.S. Department of Health, Education and Welfare
   Public Health Service
   Health Services Administration
   Bureau of Community Health Services
   Rockville, Maryland 20856

6. Superintendent of Documents
   Government Printing Office
   Washington, D.C. 20402

7. U.S. Department of Agriculture
   Nutrition Program
   Consumer & Food Economics Institution
   Agricultural Research Service
   Hyattsville, Maryland 20782

AUDIO-VISUALS

1. U.S. Food and Drug Administration
Room 601
575 N. Pennsylvania
Indianapolis, Indiana 46204
*Available without charge by letter of request. Have free publications which reinforce audio-visual presentation. Specify number in audience.

2. Milner-Fenwick, Inc.
2125 Greenspring Drive
Timonium, Maryland 21093
*Rentals. Order 3 weeks prior to show date.

3. Kansas Center for Mental Retardation and Human Development
223 Haworth Hall
University of Kansas
Lawrence, Kansas 66045
*Rental.

4. National Foundation/March of Dimes
Division of Health Information and School Relations
Box 2000
White Plains, New York 10602
*Order films 2 months in advance. Most are on loan basis.

5. Indiana Association for Retarded Citizens
752 East Market St.
Indianapolis, Indiana 46202
*On loan by request.

6. United Cerebral Palsy of Indiana
445 N. Pennsylvania Ave.
Indianapolis, Indiana 46204
*Loan.

7. National Audio Visual Center
National Archives & Records Service
General Services Administration
Order Section DA
Washington, D.C. 20409
*Rental.

8. CRM-McGraw-Hill Films
110 Fifteenth St.
Del Mar, California 92014
*Rental.

9. The Professional Library
Division of Instructional Media
Indiana Department of Public Instruction
120 W. Market St. 10th Floor
Indianapolis, Indiana 46204
*Loan.

10. Indiana State Board of Health
Division of Health Education
1330 West Michigan St.
Indianapolis, Indiana 46206
*Loan for 10 day period.

11. Indiana University
Audio-Visuals
Bloomington, Indiana 47401
*Rental.

12. Northern Regional Service Center
635 S. Main St.
South Bend, Indiana 46623
*Loan.

13. Indiana Dairy Council Offices Listed under Agencies. (#8)

14. Indiana March of Dimes Offices Listed under Agencies. (#20)

15. Time-Life Multimedia
Distribution Center
100 Eisenhower Drive
Paramus, New Jersey 07652
Telephone: 201-843-4545
*Rental.

DIRECTORIES

1. Birth Defects Genetic Services
International Directory
National Foundation/March of Dimes
Box 2000
White Plains, New York 10602

2. Directory of Services for the Handicapped in Indiana
Commission for the Handicapped
Indiana State Board of Health
1330 West Michigan St.
Indianapolis, Indiana 46206
Telephone: 317-633-5680

3. Indiana Mental Retardation Directory
Indiana Association for Retarded Citizens
752 East Market Street
Indianapolis, Indiana 46202
*Excellent
Telephone: 317-632-4387

4. Indiana School Directory
State Department of Public Instruction
227 State House
Indianapolis, Indiana
Telephone: 317-633-5640

5. National Directory of Services for School-Age Parents
NACSAP
7315 Wisconsin Ave.
Suite 211-W
Washington, D.C. 20014
Telephone: 301-654-2335

6. Northern Regional Service Center
635 S. Main St.
South Bend, Indiana 46623

7. Protective Services for Abused and Neglected Children
and Their Families
ED 135 171 EC093053 $.83 plus postage

INTRODUCTION TO
MENTAL RETARDATION

I. Introduction To Mental Retardation

"The Puzzle Of Intelligence. . .
The Pie of Causation. . .
The Possibilities of Prevention"

Objectives

General

a. To give the students an understanding of what mental retardation is.
b. To give the students an understanding of what factors cause mental retardation.
c. To give the students an understanding of what the possibilities are in preventing mental retardation today.

Specific

Cognitive

1. The student will be able to define mental retardation.
2. The student will be able to fit mental retardation into the spectrum of intelligence.
3. The students will be able to describe the various characteristics of the four broad categories of mental retardation.
4. The student will be able to state mental retardation incidence in percent.
5. The student will be able to list six broad causation factors in mental retardation.
6. The student will be able to outline four humanistic and four economic reasons why mental retardation should be prevented.

Affective

1. The student will feel that the quality of human life starts before birth.
2. The student will feel that mental retardation can be devastating to the intelligence and emotional well-being of an individual.
3. The student will feel that mental retardation is expensive to parents and society.
4. The student will be interested in finding out how he or she as a potential parent can take their responsibility in working towards the prevention of retardation in the next generation.
5. The student will accept that 1/2 of mental retardation can now be prevented.

Background Information for the Teacher

THE PUZZLE OF INTELLIGENCE

Six million Americans are mentally retarded. Each year 60,000 more mentally retarded children or 3% of all births are added to that number ... one infant every two minutes. Adding these two sentences together means that 2½ million children are expected to be born or become mentally retarded by the year 2000. Estimates of mental retardation by age and degree are shown below in Figure 1.

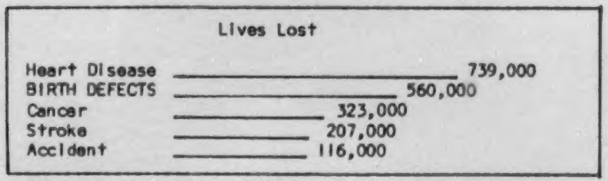
Figure 1. Estimates of Retardation by Degree - 1970 Census

General Population	203.2 million
3% of General Population	6.1 million
Retarded	
Profound (IQ below 20) About 1½% of the Mentally Retarded	92 thousand
Severe (IQ 20-35) About 3% of the Mentally Retarded	183 thousand
Moderate (IQ 36-51) About 6% of the Mentally Retarded	366 thousand
Mild (IQ 52-67) About 84% of the Mentally Retarded	5¼ million

*Adapted from Facts on Mental Retardation, National Foundation, March of Dimes.

Birth defects are the second greatest destroyer of life in the United States outranked only by ... you guessed it, heart disease. Consider the following graph.

Figure 2. Estimated Annual Loss of Lives From Selected Causes of Death in the United States.



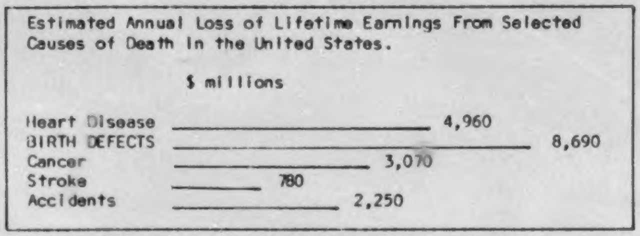
*Adapted from Don't Read This, National Foundation, March of Dimes.

The social and economic costs of mental retardation to individuals, families and society are monumental. The two columns, economic and social, march together as potentially endless lines.

Figure 3. Possible Economic and Social Costs of Mental Retardation.

Possible Social Costs	Possible Economic Costs
Disappointment and anguish for the parents	Residential care $18,000 per resident in an Indiana State Hospital for the Retarded
Grief and guilt for the parents	Rehabilitation
Parental worry	Life long support
Drain on parental energy	Special education
Strains on family and marital relationships	8.7 billion dollars in lost earnings per year**
Damaged self esteem for the retarded individual	2.0 billion in tax money for services
Lack of freedom in life style and options for the retarded individual	Welfare payments of over 400 million per year
Loneliness and desolation for the retarded individual	Unusual medical care costs for parents or guardians of a retarded individual
Physical suffering for the retarded individual	1.7 billion spent by HEW on the mentally retarded per year

**Figure 4. Estimated Annual Loss of Lifetime Earnings From Selected Causes of Death in the United States.



*Adapted from Don't Read This, National Foundation, March of Dimes.

In the past the mentally retarded have been abandoned, imprisoned, tortured, exorcised, excluded and collected in warehouses in attempts to rid society of the economic and social problems created by their presence. The rights, care, treatment and education of the retarded have marched steadily forward from 1770 thru 1978 picking up tremendous speed in the last twenty years as parents, physicians, educators, bioscientists and social scientists have joined hands in working for humane and effective care, education, treatment, rehabilitation, mainstreaming and laws for the retarded. The time line on the following page outlines that progress.

Figure 5. Timeline In The Care, Treatment And Education of The Mentally Retarded 1770-1970

1770 Classes for Deaf begin in Paris under Abbe de l'Epee.

1780 School for Blind begins in Paris.

1790

1800 Jean Itard, physician and teacher of the deaf works and trains Victor, the wild boy of Averyon who had been raised by wolves.

1810 Napoleon orders a census of defective people within his empire.

1820 Gallaudet starts a school for defectives in the United States.

Louis Braille develops the "point alphabet".

1830 Seguin, a student of Itards, heads the Pennsylvania Training School.

1840

1850 Samuel Howe starts the Massachusetts School for the mentally retarded. Its results failed to match expectations and philosophy swung to custodial care to protect society from the retarded.

1860

1870 Association of Medical Officers of American Institutions for Mental Retarded started.

1880

1890 First special education classes started in Providence, Rhode Island.

1900 Alfred Binet's age scale for functioning level brought to U.S. Many states build institutions for the retarded. An orientation with low patient-staff ratios.

1910 Maria Montessori educates defectives in the slums of Rome using didactic materials.

1920 Teacher training for special education begins in Epsilanti, Michigan.

1930 Parent organizations as pressure groups begin to form. Association of Medical Officers of American Institutions changes its name to American Association of Mental Deficiency.

1940

1950 Parent groups reach real strength as NARC totals 50,000. Forces establishment of special education classes for the mentally retarded. Association of Medical Officers formed in 1876.

1960

Bureau of Education of Handicapped provides funding and direction.
1970 Standards established for residential institutions. Kennedy appoints President's Panel on Mental Retardation.

Figure 5. Timeline In The Care, Treatment and Education of The Mentally Retarded 1970-1978

1970 Joint commission for accreditation of hospitals established.

1971 Mandatory special education in Indiana legislated.

1972

1973 Education of Handicapped Act passed at a national level. Rule S1, the regulations and rules surrounding mandatory special education in Indiana adopted by the Commission on General Education.

1974

1975 Education for All Handicapped Children Act: Public Law 94-142 passed at the national level.

1976

1977 National Rehabilitation Act, Section 504, a civil rights document for the handicapped passed at the national level.

1978 Education for All Handicapped Children Act: Public Law 94-142 implemented at a national level.

Who are these six million Americans among us? Mental retardation is not a disease or syndrome but comprises a spectrum of conditions which may be determined by many factors of a biological, psychological and social nature. It is a symptom of a vast number of disorders with mental retardation as one of the resulting factors. The well respected American Association on Mental Deficiency defines mental retardation as:

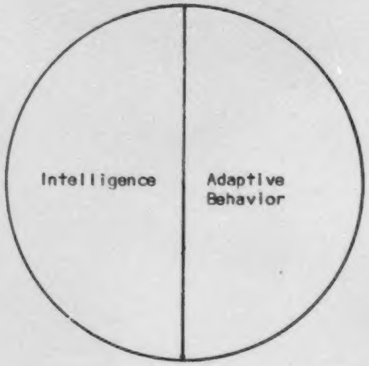
> "Significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior, and manifested during the developmental period."

Breaking that apart a bit . . .

... Significantly subaverage intellectual functioning means two standard deviations below the mean intelligence quotient of 100 or approximately 70 IQ and below.

... Adaptive behavior means the effectiveness or degree with which the individual meets the standards of personal independence and social responsibility expected of his age and cultural group.

... Developmental period means from conception to 18 years of age.



Originating From Conception to Eighteen

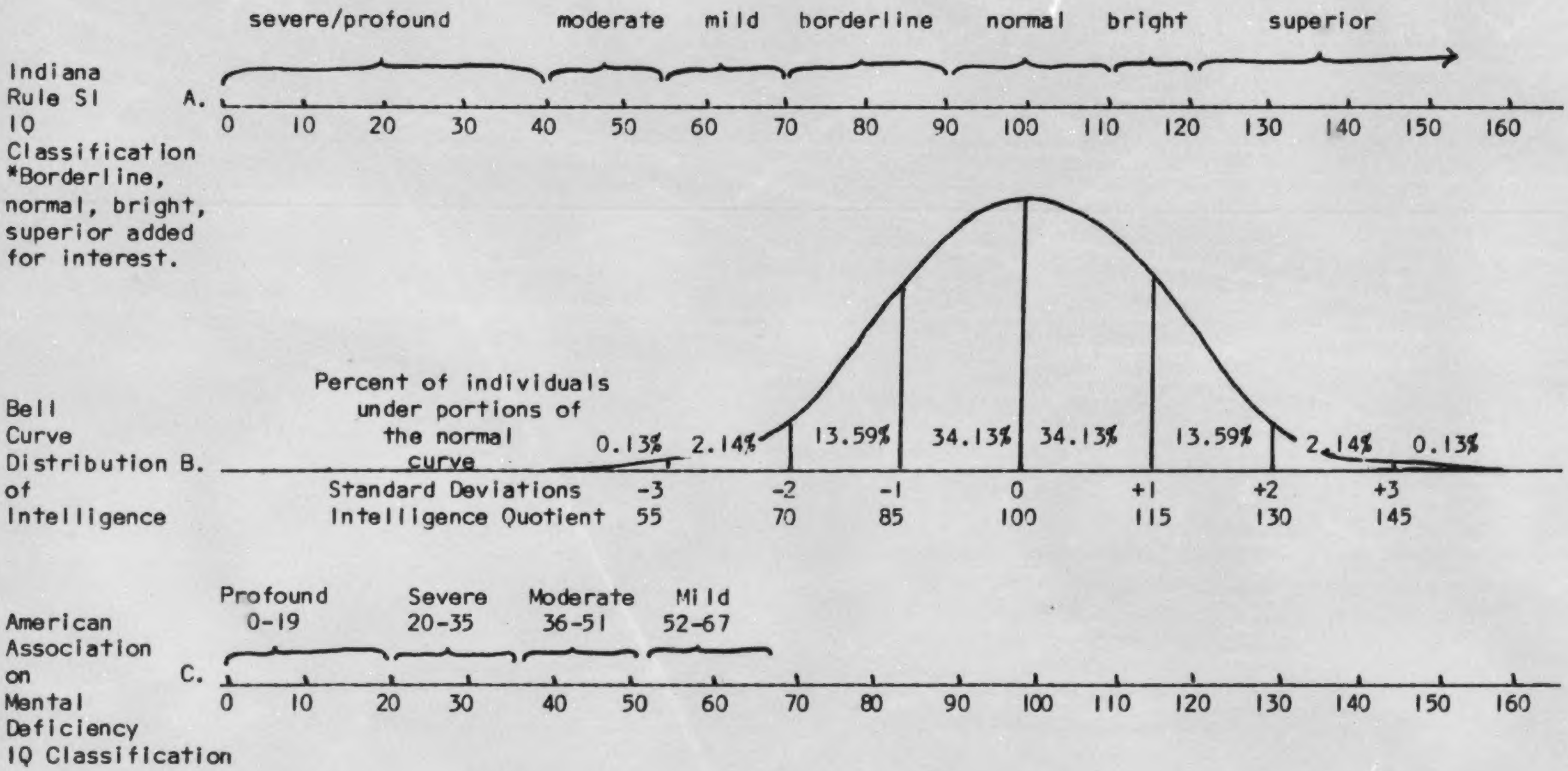
How do the retarded fit into the "population puzzle", the broad spectrum of intelligence? It is valuable for every teacher whether involved in the prevention of retardation or not to understand the broad range of intellectual differences among children that you will face in class. Figure 6 shows:

1. Comparison line drawing of how the population falls into a typical bell curve.
2. The percentage of population falling under each section of that curve according to intelligence quotient.
3. The IQ breakdown in Indiana's Mandatory Education Mental Retardation Classifications. Rule SI (1976)
4. The American Association on Mental Deficiency's 1973 Mental Retardation Classification System.

If intelligence quotient is a new concept for you think, "If an IQ or intelligence quotient of 100 is considered normal for the average person then an IQ of 40 indicates that the individual at the time of testing shows a potential for performance of 40% of normal".

These classification systems are constantly changing to better define the segment of the population needing services. The Bell Curve is very much a reality but classification systems are useful only if they better define the subgroups of individuals which can be matched with effective methods of education, care and services.

Figure 6. The Puzzle of Human Intelligence: Intelligence Quotient Distribution



What are the mildly, moderately, profoundly and severely retarded individuals like? The comparison below profiles in summary the four broad classifications of the mentally retarded. They are generalities, possible characteristics, and should in no way be considered absolutes or rigid divisions.

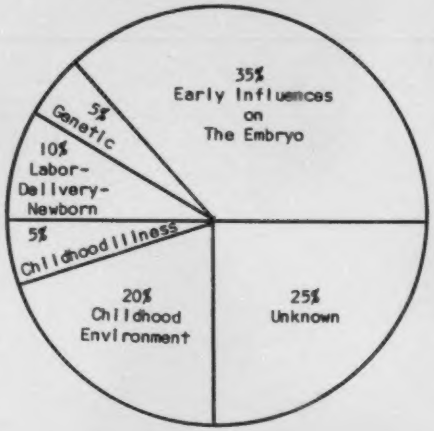
Figure 7. Broad Categories of Retardation: Possible Characteristics

MILD	MODERATE	SEVERE	PROFOUND
Indiana Rule SI 1973 Term: Educable Mentally Retarded IQ 55-70	Indiana Rule SI 1973 Term: Trainable Mentally Retarded IQ 40-55	Indiana Rule SI 1973 Term: Subtrainable Mentally Retarded IQ 0-40	Indiana Rule SI 1973 Term Subtrainable Mentally Retarded IQ below 20 Grouped with Severe.
AAMD classification: Mildly Retarded IQ 52-67	AAMD classification: Moderately Retarded IQ 36-51	AAMD classification: Severely Retarded IQ 20-35	AAMD classification: Profoundly Retarded IQ below 20
M.A. 8.6 - 10.10 years Grade level 4-5 grade.	M.A. 6.1 - 8.5 years Grade level 1-3.	M.A. 3.9 - 6 years Grade level preschool to one.	M.A. 0 - 3.8 years Grade level infant to pre-school.
Capable of competitive employment. 80% gain semi or skilled work. Live independently. Assistance or guidance may be needed under unusual social or economic stress. Poor self concept. Poor social acceptance. Inadequate interpersonal skills. As adults may live in low social economic area of community. Impairment in logic, reasoning and short term memory.	Unskilled or semi-skilled work capability or sheltered workshop. Some supervision needed in living situations. Supervision needed under social and economic stress. Speech and language limited. Social and behavioral skills may be bizarre. May be lethargic or easily excitable. High incidence of visual, auditory, physical problems.	May contribute partially to self maintenance under supervision. High probability of behavior disorders. Capable of self care and sheltered workshop skills. Often physically handicapped. Minimal language or nonexistant. May be autistic.	Few are toilet trained. Lifelong care and supervision for survival. Gross impairment in physical and sensory development. Capable of self care and workshop skills. Extremely fragile physiologically. May fail to attend to pronounced stimuli.

THE PIE OF CAUSATION

What causes mental retardation? Authorities present conflicting incidence rates for causation factors making up the total "pie of causation" because they tend to look at causation from their own professional point of view. What follows is a composite of the broad categories of causation factors of mental retardation occurring before, during and after birth.

Figure 8. The Pie of Causation Factors in Mental Retardation



THE POSSIBILITY OF PREVENTION

Can mental retardation be prevented? Under President Kennedy in 1961 The President's Panel on Mental Retardation stated that

> ***Mental retardation could be reduced by 50% by the year 2000 if we applied our present knowledge and technology in the prevention of retardation.***

Each president since Kennedy has reaffirmed this national goal. The President's Committee on Mental Retardation said

> ***If the American people have the will to achieve this goal, it can be done...but it will require a serious and sustained effort to apply the means that are available to reach the halfway mark in the next 25 years. It is entirely feasible with the knowledge that we now have. To exceed the president's goal for this century is quite possible if we expand knowledge and apply it at the rate we have done in the past 25 years.***

Great strides have been made in the known preventable causes of mental retardation in relation to:

- nutrition
- control and treatment of disease
- genetic counseling
- identification and treatment of inborn errors of metabolism
- high risk pregnancy identification and care
- early identification of learning problems
- early childhood stimulation
- intervention in child abuse
- childhood accident prevention
- harmful drug and environmental chemical identification
- birth and labor alternatives
- management of maternal illness

Even though 25% of the causes of mental retardation are unknown we need not wait until all the data is in, all the facts collected. That finite period will never come. We must begin. If the number of those who are severely retarded could be decreased savings would be 2.7 billion. The savings in disappointment, misery and isolation would be immeasurable.

Let Us Begin . . .

Pretest

Cognitive

1. A mentally retarded individual is one whose
   ____a. intelligence quotient falls between 0 and 70.
   ____b. intelligence quotient falls between 0 and 70 and has problems of social adjustment and independent living.
   ____c. independent living and social adjustment are difficult.

2. Approximately ____ of the population is mentally retarded.
   ____a. 50%
   ____b. 25%
   ____c. 3%

3. The trainable mentally retarded individual's intelligence level is
   ____a. from 0-35 IQ
   ____b. from 35-55 IQ
   ____c. from 55-70 IQ

4. The profile of the subtrainable mentally retarded child would include a mental age of
   ____a. from 0 - 3 years
   ____b. from 3 - 7 years
   ____c. from 7 - 12 years

5. Mental retardation costs the nation ________ of dollars each year.
   ____a. thousands
   ____b. millions
   ____c. billions

6. The greatest tragedy of mental retardation is
   ____a. economic loss
   ____b. devastation to the retarded individual
   ____c. guilt of parents

7. _____ of mental retardation is now preventable if present methods of prevention were applied.
   ____a. 100%
   ____b. 50%
   ____c. 10%

8. Causes of mental retardation are
   ____a. only biological
   ____b. only environmental
   ____c. biological and environmental

Key: 1.b, 2.c, 3.b, 4.a, 5.c, 6.b, 7.b, 8.c

Affect Barometer

Circle the word or words which best represent the intensity of your feelings.

1. The quality of life starts before birth.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

2. One of my children could be born mentally retarded.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

3. Fifty percent of mental retardation can now be prevented.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

4. I would like to find out what I can do to prevent or lessen the probability that I could have a handicapped child.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

5. I feel that mental retardation could be very expensive to me as a taxpayer and as a parent of a retarded child.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

Mini-Lecture or Presentation

"The Puzzle"

Student Involvement: A Classroom Poll.
Ask everyone to write on a piece of notebook paper one of these statements:

1. I have a mentally retarded child or adult in my family.
2. I do not have a mentally retarded child or adult in my family.

Have them fold their papers and collect them. Quickly tally the number of students who have a mentally retarded member in their family.

Instructor: We have ____ members of this class whose families have been touched by mental retardation. Statistically one in every ten families has a mentally retarded child or adult in their immediate family. Mental retardation can touch anyone's life and particularly the child or children that you may have.

Student Involvement: A Population Puzzle.
What is this thing called mental retardation? We are going to assemble a puzzle which will give us some clues. Ask eight students to put the "puzzle of intelligence" pieces (made from dittos 1-8) together on the blackboard. I'll give you a clue. It should look like a mountain. You will need some tape.

Instructor: After the puzzle is correctly assembled: There is the mountain of humanity . . . scientifically known as the bell curve which shows the whole range of intelligence in man.

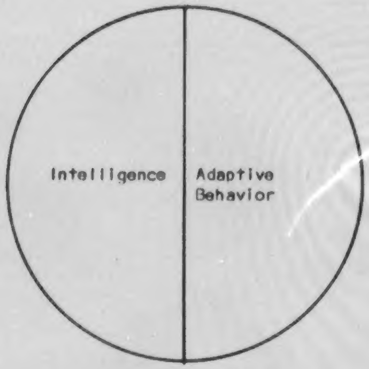
(Fill in numbers as you talk using Figure 6 as a guide.)

The numbers stand for intelligence quotient. A new concept? Think of it as: If an IQ or intelligence quotient of 100 is considered normal for the average person then an IQ of 40 indicates that the individual at the time of testing shows a potential for performance of 40% of normal. A person with an 100 IQ at the time of testing shows a potential for performance of 100% or "normal". The puzzle tells us that: (use assembled puzzle to illustrate each point)

1. 50% of the population falls in the intelligence quotient range from 90 to 110.
2. 25% of the population is above the "normal range".
3. 25% of the population is below the "normal" range.
4. Of the 25% falling below the normal range 3% are considered mentally retarded.
5. Of that 3% 2.3% are educable mentally retarded or mildly retarded, .3% are trainable mentally retarded or moderately retarded, .4% are severely or profoundly mentally retarded.

This 3% of the puzzle represents 6 million Americans. In the United States 60,000 are added to that number each year, 2,500 of these being Indiana residents. Since this class has started today _____ infants have been born mentally retarded (one every two minutes).

6. This part of the intelligence puzzle costs:
   a. 8.7 billion in lost earnings per year.
   b. 2.0 billion in tax money for special services.
   c. over 400 million in welfare payments per year.
   d. $18,000 per year for one child in an Indiana State Hospital or $1,260,000 for a life span of 70 years.
7. A child born within this range of intelligence in the "intelligence puzzle" often leads a life of loneliness, isolation, perhaps physical suffering and constant knowledge that he is different, less than whole . . . retarded.
8. A person who is labeled retarded falls in the IQ range of 0 - 70 but he must also have problems in functioning independently and adjusting socially. The devastation to intelligence, according to definition, must originate during the developing years from conception to 18 years of age. (Illustrate with the symbolic drawing below.)



Originating from conception to 18

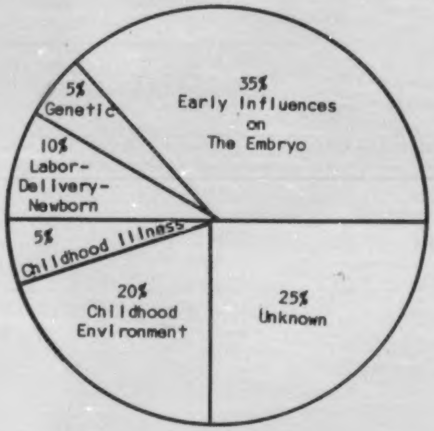
Student Involvement:

Take four profile forms each. (Prepare profile forms with Ditto 9. Make enough for four for each class member.) Let's role play. Four of your classmates have agreed to play the parts of:

... a mildly retarded child
... a moderately retarded child
... a severely retarded child
... a profoundly retarded child

See if you can write a profile of each type of retarded child on your "profiles" as they talk. (Prepare role cards for four students from dittos 10 through 13.)
Hold your questions until they are done.

Instructor: Clarify characteristics of each by answering questions. What causes this devastation in human intelligence? How can this happen? Use board to illustrate causation factors.



"Possibility of Prevention"

Student Involvement: Possibility of Prevention.
Have two students read the messages from the President's Panel on Mental Retardation. Prepare from ditto 14.

Student #1
Mental retardation could be reduced by 50% by the year 2000 if we applied our present knowledge and technology on the prevention of retardation.

Student #2
If the American people have the will to achieve this goal, it can be done - but it will require a serious and sustained effort to apply the means that are available to reach the halfway mark in the next twenty-five years. It is entirely feasible with the knowledge that we now have. To exceed the president's goal for this century is quite possible if we expand knowledge and apply it at the rate we have done in the past twenty-five years.

Instructor: We could cut this pie of causation in half. Fantastic! Mind-boggeling! Great strides have been made in the known preventable causes of mental retardation in relation to:

... Nutrition
... Immunization
... Control and treatment of disease
... Genetic counseling
... Identification and treatment of genetic defects
... Identifying pregnancies that are high risk and their care
... Early identification of learning problems
... Childhood accident prevention
... Identification of harmful drugs and environmental chemicals
... Birth and labor alternatives
... Management of illness of the pregnant woman

As caring, active young adults committed to the improvement of society you will want to know about means of prevention so you can pass on to your children every baby's birth right:
"The right to be well born."
"The right to a healthy development."

CARING IS A CHOICE. We are going to learn and understand how to do everything possible to prevent retardation in your future child or children. Now you have no or very little choice as to whether a child born to you in the future is born whole or defective. It is now mostly a matter of luck.

We will learn what you can specifically do, what ACTION you can take as a

... Teenager
... Woman and Man
... Woman and Man Planning for a Child
... Pregnant Woman and the Father
... Woman in Labor and Birth and the Father
... Mother and Father of the Newborn

to prevent or lessen the probability that you will have a handicapped child.

☐ Classroom Experience Options

To be used for an experiential introduction to mental retardation, reinforcement or extension of the presentation.

1. Introduce the possibility of prevention by having class members screened for lead by a person from the Board of Health.
2. Introduce the possibility of prevention by having a person from the health department demonstrate PKU testing.
3. Use the prevention of mental retardation as a theme for "poster making" for the health classroom.
4. Interview a health department official concerning what they are doing to prevent mental retardation.
5. Have students compose a letter and send it to a local obstetrician asking what information they give to expectant parents on prevention of mental retardation.
6. Have a speaker about causes and prevention of mental retardation.
7. Have a panel discussion of mentally retarded adults on how it feels and the problems it presents being mentally retarded.
8. Have a panel discussion by parents of mentally retarded children on the problems and costs of caring for a retarded child.
9. Have the students write a "bill of rights" for themselves pretending they are an unborn child.
10. Show one of the following films:
    a. Title: President's Committee on Mental Retardation In Action
    Time: 9 min. 16mm. color 1974
    Content: Prevention of mental retardation and deinstitutionalization two national goals supported by the President's Committee on Mental Retardation are discussed in this film describing committee action. Goals include the 50% reduction of the incidence of mental retardation and deinstitutionalization of at least 30% of the 200,000 persons in public institutions, to be accomplished by the end of this century.
    Available from: ⊗ #3 Rental: $5.40/day

    b. Title: The Multiply Handicapped
    Time: 23 min. 16mm. 1970 Rental: Free
    Content: Shows mentally retarded, cerebral palsy, dyslexia, deaf-blind, deaf and emotionally disturbed deaf children in Sweden and Germany, The Netherlands and England.
    Available from: ⊗ #9

    c. Title: Introduction to Mental Retardation
    Time: 20 min. filmstrip and cassette 1977
    Content: Identifies etiologies and symptoms of mental retardation according to American Association on Mental Deficiency System. Describes historical and present treatment and prevention of mental retardation including hereditary and biological factors. Develops a humanistic perspective towards mental retardation.
    Available from: ⊗ #9

    d. Title: Prevention of Birth Defects
    Time: 20 min. 35 mm. slides & cassettes 1976
    Content: Deals with the incidence of mental retardation, causes of birth defects and seventeen recommendations for increasing chances of having healthy children.
    Available from: ⊗ #9

11. Give out one, several or all of the following pamphlets to each class member:
    a. Don't Read This
    b. All About the March of Dimes
    c. Impossible to Prevent Birth Defects?
    d. Questions and Answers on Birth Defects
    e. Facts: 1977
    f. Birth Defects: The Tragedy and The Hope
    All of the above available from ⬡ #20
    g. Facts on Mental Retardation ⬡ #24
    h. The Problem of Mental Retardation ⊜ # 5
    i. Hello World ⊜ #5
12. Discussion Questions:
    1. How would you feel about yourself if you were mentally retarded?
    2. Why is it our responsibility as a person to prevent mental retardation?
    3. Why is it our responsibility as a society to prevent mental retardation?
    4. How would you feel as you faced your child for the first time knowing that he or she had a birth defect?
    5. Why does mental retardation cost so much?

Outside Classroom Experience Options

To be used as an experiential introduction to mental retardation, reinforcement or extension of the classroom presentation.

1. Visit a state institution or community center for mental retardation.
2. Visit a March of Dimes women, infant and children feeding program.
3. Arrange for groups of four within the classroom to take a mentally retarded individual on an outing.
4. Observe the Department of Health using a lead probe to test for lead in the environment.
5. Identify toxic elements of the environment in your community.
6. Survey your home and list the risk factors to a pregnant woman and/or the growing child.
7. Perform controlled animal or chicken egg experiments in biology class to show the effects of drugs and/or nutrition on the developing embryo or growing animal.
8. Have students work with a mentally retarded individual at a state institution or community center for the retarded on a one to one or small group basis.
9. Visit a high risk infant nursery at a community hospital.

✓ Action Checklist

Hand out action checklist to each class member for their consideration. (Prepared from ditto 14.)

INTRO
TO MENTAL
RETARDATION

____ I want to learn as a potential parent how I can specifically take action to prevent mental retardation or lessen the probability that I will have a handicapped child.

Post Test

Give the same test used in the pretest. Let the students see how many answers that they originally did not know that they can correct. Use as an in class or home work activity. Determine the individual and class gains.

I. Introduction to Mental Retardation

Ditto I.

A Population Puzzle

I. Introduction to Mental Retardation

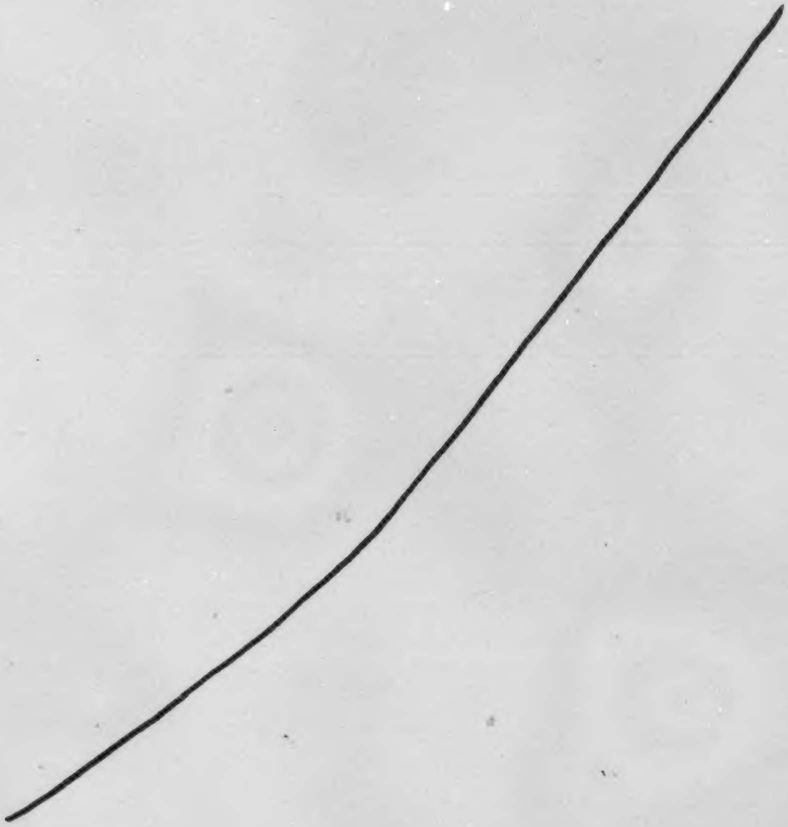
Ditto 2.

A Population Puzzle

1. Introduction to Mental Retardation

Ditto 3.

A Population Puzzle



I. Introduction to Mental Retardation

Ditto 4.

A Population Puzzle

I. Introduction to Mental Retardation

Ditto 5.

A Population Puzzle

I. Introduction to Mental Retardation

Ditto 6.

A Population Puzzle

I. Introduction to Mental Retardation

Ditto 7.

A Population Puzzle

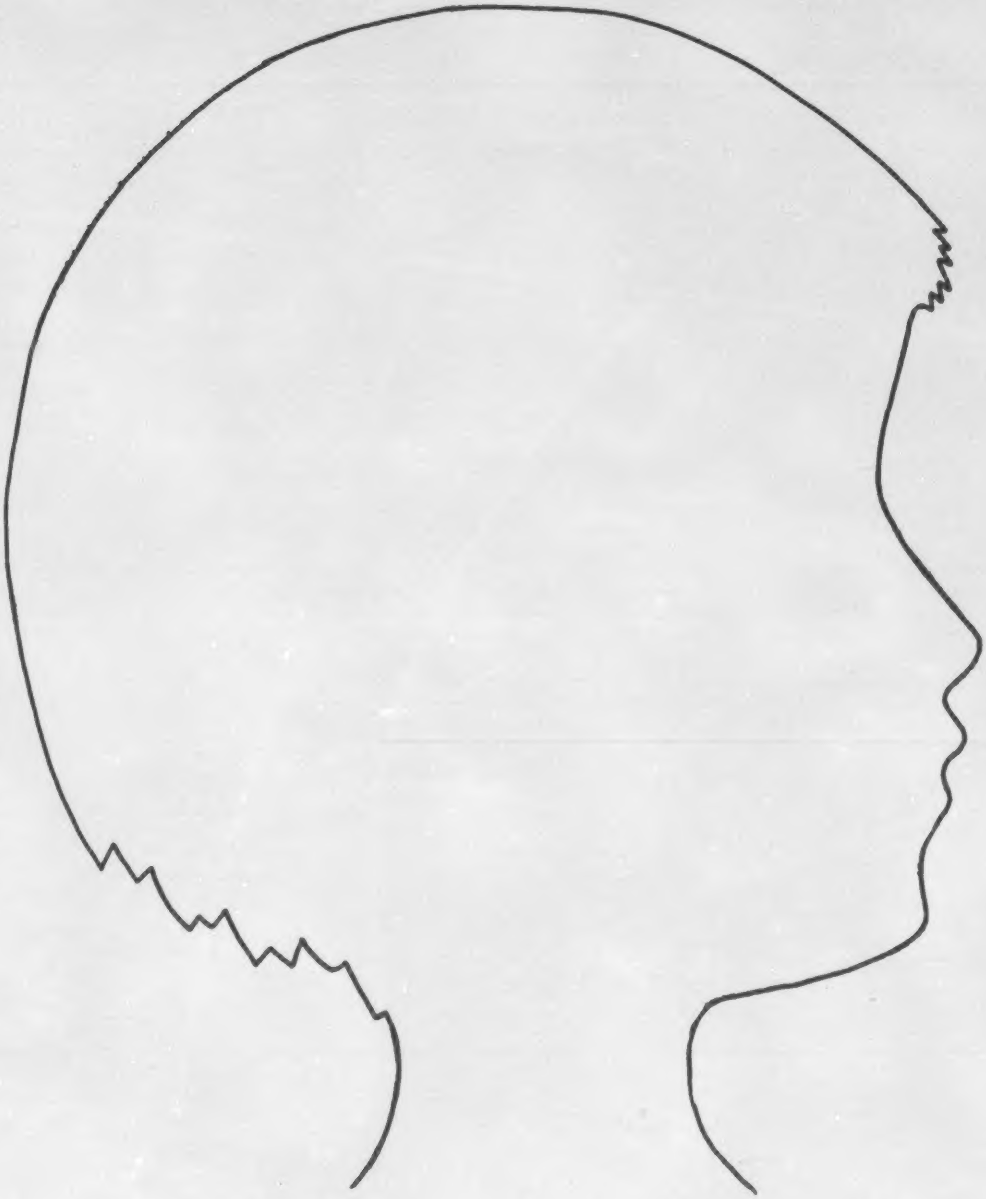
I. Introduction to Mental Retardation

Ditto 8.

A Population Puzzle

I. Introduction to Mental Retardation

Ditto 9 Profile Form



I. Introduction to Mental Retardation

Ditto 10

Profile of a Mildly Retarded Child

I'm Susan. I was born mentally retarded. They say it is because I am a microcephalic ... my skull was too small for my brain damaging it as it grew. My IQ measures anywhere from 55 to 70. My mental age intellectually is from 8 to 10 years but socially and physically I am very much like everyone else. Other kids call me "the retard" and I don't think much of myself. I will be able to live independently when I get out of high school and will probably get a semi or skilled job. Eighty percent of us do work in the competitive job market. Fifth grade will be as far as I will be able to achieve academically. In unusual or stressful social or economic situations I may need guidance.

I. Introduction to Mental Retardation

Ditto II

Profile of a Moderately Retarded Child

Hi! I'm Bill. People call me a mongoloid because that's what made me retarded. My IQ in testing measures between 35 and 55. My academic work is from the first to third grade level. I don't talk very well and sometimes I do things people think are strange because my logic and reasoning are limited. I have visual, auditory and physical problems but I can be trained as a semi skilled worker or work in a workshop. I will probably need some degree of supervision most of my life, especially under social and economic stress. However, I plan to live semi-independently. My mental age academically is from 6 to 8 years but in many social and physical aspects I am much like you "normals".

Ditto 12

Profile of a Severely Retarded Child

I'm Karen. I attend school but my grade level is from preschool to grade one. I am learning self care and sheltered workshop skills. I have a number of physical handicaps. My language is minimal or sometimes nonexistent. I have many behavior problems that turn people off to me and I look funny because I have many physical defects. I may be able to work in a sheltered workshop after my school years and contribute to my support under supervision. My mental age is between 3 and 6 years and my IQ measures between 0 and 40 in testing. They say I am severely retarded because my mom had measles while I was inside of her.

Ditto 13

Profile of a Profoundly Retarded Child

Hi! I'm Jimmy. I cannot walk or talk. Sometimes I do not even respond to light, sound or touch. My body and mind have many things wrong with them. I am that way because of a genetic defect and because I had encephalitis as a baby. I will need life long care and supervision. I am not toilet trained and must be fed. However, I am beginning to learn to feed myself. My mental age is from 0 to 3 years and my IQ is below 20. My school program is of an infant to preschool type.

I. Introduction To Mental Retardation

Ditto 14

Statements from The President's Panel on Mental Retardation

Student #1

Mental Retardation could be reduced by 50% by the year 2000 if we applied our present knowledge and technology on the prevention of retardation.

Student #2

If the American people have the will to achieve this goal, it can be done - but it will require serious and sustained effort to apply the means that are available to reach the half way mark in the next twenty-five years. It is entirely feasible with the knowledge we now have. To exceed the president's goal for this century is quite possible if we expand knowledge and apply it at the rate we have done in the past twenty-five years.

I. Introduction to Mental Retardation

Ditto 15

____ I want to learn as a potential parent how I can specifically take action to prevent mental retardation or lessen the probability that I will have a handicapped child.

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THE TEENAGER

II. The Teenager

Their Responsibility in The Prevention of Mental Retardation in The Next Generation

"The Teen Ingredients . . .
Putting It All Together . . .
To Prepare Potentially Healthy Parents"

Objectives

General

a. To give the students an understanding that mothering and fathering a child in the teen years can be potentially dangerous to the mental functioning of the child.

b. To give the students a feeling that the quality of life begins before birth.

c. To give the students an understanding that preparing the body to be a parent begins long before conception, pregnancy and birth.

d. To give the students information on specific causes of mental retardation which have their beginnings in the teenage years.

e. To give the students the "know-how" of what they can do in the teen years as potential mother and father to prevent or lessen the possibility of mental retardation in their own child or children.

f. To give the students the motivation to carry out that responsibility.

Specific

Cognitive

1. The student will be able to state the moment at which the quality of life of the unborn child begins.
2. The student will be able to state who determines the quality of life of the unborn child.
3. The student will be able to cite the numerical risk of prematurity to babies born to teenage parents.
4. The student will be able to give five suspected causes of premature birth.
5. The student will be able to give five dangers of premature birth to the infant.
6. The student will be able to state the optimum age range for childbearing.
7. The student will be able to give a reason why it is a nutritional strain on the body to nurture an unborn child in the teenage years.
8. The student will be able to give two reasons why it is important for the parents of a child to have adequate nutrition.
9. The student will be able to name two infections which are devastating to the unborn child which can be prevented or lessened by immunization in the teenage years.
10. The student will be able to name two venereal diseases which may cause mental retardation in the unborn child.
11. The student will be able to explain how Syphilis and Herpes Simplex II may be avoided.
12. The student will be able to explain how excessive medical and dental x-raying throughout childhood and young adulthood can potentially damage a child in the future.
13. The student will be able to state how x-ray damage may be decreased in the essential use of diagnostic x-rays.
14. The student will be able to explain why sexual activity in the teen years results in a uterus which cannot hold a fetus for a full nine months.

Affective

1. The student will feel that the quality of life starts before birth.
2. The student will feel that the health of the mother and father as childbearers begins well before conception.
3. The student will feel that there is a risk to an unborn child if the quality of the mother's and father's health is less than "good".
4. The student will feel that there is a risk to an unborn child if the physical maturing of the mother and father is still in process.
5. The student will be motivated to take personal action to:
   - a. limit childbearing to 20-35 years of age.
   - b. be sexually responsible.
   - c. avoid venereal disease.
   - d. be tested for venereal disease if infection is a possibility and obtain treatment if infected.
   - e. be immunized against Rubella and keep immunizations up to date.
   - f. eat a diet adequate in calories and nutrients in the teenage years.
   - g. be in control of their own lives in relation to drugs, self medication, alcohol and smoking.
   - h. avoid excessive or unnecessary x-rays for medical and dental diagnosis and treatment.
   - i. request proper shielding of the sex organs when being x-rayed. (particularly males)
   - j. (girls only) obtain regular cervix examination and possible repair if involved in frequent sexual intercourse in the teen years.
   - k. follow all recommendations for:

- the man and woman
- the man and woman planning for a child
- the pregnant woman and the father
- the woman in labor and birth and the father
- the mother and father of the newborn

if they find themselves either a mother or father in the teen years.

Background Information for the Teacher

A THREE POINT PROBLEM

1. One of the main difficulties in being a teenager is SEX! It is
   - ... a great discovery.
   - ... a great pleasure.
   - ... a great frustration.
   - ... a great mystery.
   - ... a great conflict.

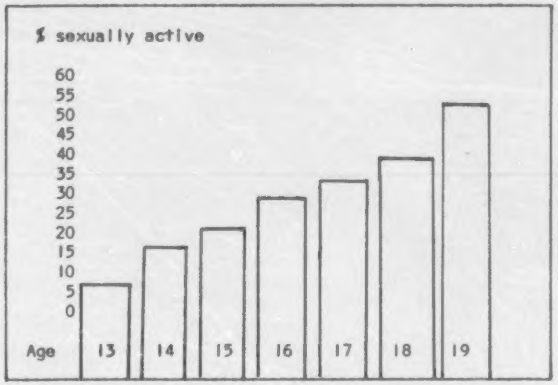
2. Some of the main difficulties in being born to teenage parents are that:
   - ... teenagers have the highest rate of any childbearing group of dead babies.
   - ... teenagers have the highest rate of any childbearing group of damaged babies.
   - ... teenagers 15 years or younger are 2.4 times more likely to have an infant born with neurological defects than infants born to mothers ages 20 to 24.
   - ... teenagers have the highest rate of any childbearing group of babies with medical complications.
   - ... teenagers are the group least likely to be able to afford adequate medical care in pregnancy and birth and they are the group who need it most.
   - ... of teenagers under 15, seven in ten get no prenatal care in the first trimester.
   - ... of teenagers under 15, 1/4 get no prenatal care at all.

3. Babies are being born to teenage parents.
   - ... Early childbearing is increasing everywhere. Close to 13 million of the 60 million women who became mothers in 1975 became parents before they became adults.
   - ... In the 1970's for females ages 15-19 there have been 58 births per 1000 females.
   - ... Ten per cent of the U.S. teenagers become pregnant each year. (6% give birth)
   - ... Each year more than one million 15-19 year olds become pregnant.
   - ... One fifth of all U.S. births are to women in their teens.
   - ... Adolescents in the U.S. have rates of child bearing among the world's highest; higher than many underdeveloped countries.

   This is because
   - ... Of the 21 million young people in the United States between 15-19, more than half have had sexual intercourse.
   - ... Of the 8 million young people in the U.S. that are 13 and 14, one fifth are believed to have had sexual intercourse.

   See Figure 9.

Figure 9. Percent of 13-19 year old females that are sexually active, by age. United States 1974-75.



*Adapted from 11 million Teenagers

In the United States only 29 states and the District of Columbia require teaching Health Education Courses in public schools. Of these 29 just 6 states and the District of Columbia mandate the teaching of some form of family life or sex education. Indiana mandates neither.

Yet eight out of ten Americans old enough to have children of junior or senior high school age favor the teaching of sex education in the schools as well as provision of contraceptives to unmarried teens.

THE QUALITY OF LIFE STARTS BEFORE BIRTH

The quality of the egg...
the quality of the sperm...
the quality of the uterus...
the quality of the placenta...

are determined long before conception, in the teenage years and before. To really "feel" that this is true the teenager must see the miraculous and dangerous journey of "the beginning of life".

As 100,000,000 sperm cells are propelled by their thrashing tails and swim upstream toward a single egg or ovum to merge to become a single unit, the journey begins. Time and time again a flawless human being is created but occasionally, 3% of the time, the process goes awry. Many threats can be eliminated if a potential parent knows how. The new human being is delicately balanced between perfect and imperfect formation for at any one of the greatly simplified progressions that follow something can go wrong.

A Dangerous 9 Month Journey

The First Trimester or Life Gets Started

Weeks	
Conception	In ovulation the ovary releases the ovum or egg into the fallopian tube where the sperm must fertilize it within 1 to 3 days.
Week 1	Within several minutes the 23 chromosomes in the nucleus of the egg cell and 23 within the nucleus of the sperm cell meld together to form one single cell with 46 chromosomes to serve as a control center for a new individual. These chromosomes have already been subjected to various environmental hazards. The cell divides over and over again forming a grape like mass of daughter cells as it journeys down the fallopian tube towards the uterus. This mass is a 32 celled Morula. In this journey the Morula changes to a Blastocyst with some cells of the Morula forming an outer layer and some cells remaining centrally located in a bundle which secretes fluids. The Morula enters the uterus and differentiation begins with cells continually forming and taking on their own identity to form the various organs with unique capabilities and characteristics receiving commands from the genes as to what they are to become. Differentiation is a delicate process and its diversion or interruption can be dangerous. The Blastocyst finds a home in the lining of the womb by secreting chemicals which dissolve some of the mother's uterus tissue opening a pathway into which it can nestle. The mother's hormones help this process by giving the uterus a spongy, pliable, inviting consistency. The quality of the uterus has been formed by the nutrition and general health of the mother. Half of all pregnancies fail at this implantation stage.

Week 2 ____The cells divide, redivide and differentiate. The food gathering cells burrow deeper into the uterine lining sending out rootlike structures called villi which will be part of the placenta.

At this point all differentiation stages have started. All organ systems have formed individual identity.

The life support system of villi, placenta and amnionic sac filled with fluid to protect and cushion the developing child have formed.

Week 3 ____The time of differentiation is one of vulnerability.

Week 4 ____The Embryo now has an elongated shape with a large sphere attached known as a yolk sac which serves as the blood formation center until the fetus can make its own bone marrow. The villi are pressing vigorously into the uterus every day to soak up nutrients from the womb. Those nutrients must be adequate and well balanced.

The limb buds form at this time in a 48 hour period.

Week 5 ____The cells multiply, grow, fold, turn and twist into new forms. The embryo is now a very recognizable living form with millions of cells each doing their specialized function.

Week 6 ____The embryo now has a more human appearance. Some of the primitive organ systems are now functioning: the heart vigorously pumping blood, the kidneys will soon filter and excrete, the thyroid and adrenals are taking shape, the central nervous system is well defined, there are primitive lungs and the stomach and intestines are formed. Interruptions at this time divert gland and organ formation.

Week 7 ____Tiny stumps of arms and legs now have tiny fingers and toes. The embryo has increased in size 10,000 fold!! This is a time of delicate balance, vulnerability and potential failure. The growing embryo needs constant support, nutrients and protection.

Week 8 ____The sensory equipment is rapidly developing. The eyes, nose, ears, muscle, bones, and cartilage are forming. It is a crucial time for the sensory organs by any disruptive element. The fetus has definitely taken on the appearance of a human being.

The Second Trimester or Growth in Weight and Size

Months

Month 3 ___New growth and refinement now take place with heightened physical activity. Bone marrow now replaces the yolk sac as a source of red blood cells. Eyelids are forming although they remain sealed until the sixth month.

The oral cavity parts fuse and the unborn child swallows.

The unborn child is laying down muscle and bone tissue, moving and exercising.

All The Fundamental Framework Is Complete. All The Basic Organs Needed To Sustain The Individual For Life Have Been Formed. It Is At This Point That A Girl Or Woman May Be Beginning To Know And Believe That She Is Pregnant.

Month 4 ___The unborn child continues to grow in size, strength and length.

Blood now pumps through the umbilical arteries to the placenta and back through the umbilical vein. Now the relationship between the baby and the outside world is more definite.

More muscle structure is laid down.

Hair and fingernails are formed.

The heart can be heard, a kick felt.

Month 5 ____Except for size the unborn child is nearly fully formed.

More weight is added. The trunk and legs elongate.

More body hair is added.

The unborn child becomes aware of his environment. The eyes open and the child sees light.

The unborn child exercises, sucks the thumb and hears outside sounds.

Month 6 ____

The Third Trimester or Growth

Month 7 ____

The unborn child accumulates fat for insulation.

The lungs and brain become more refined.

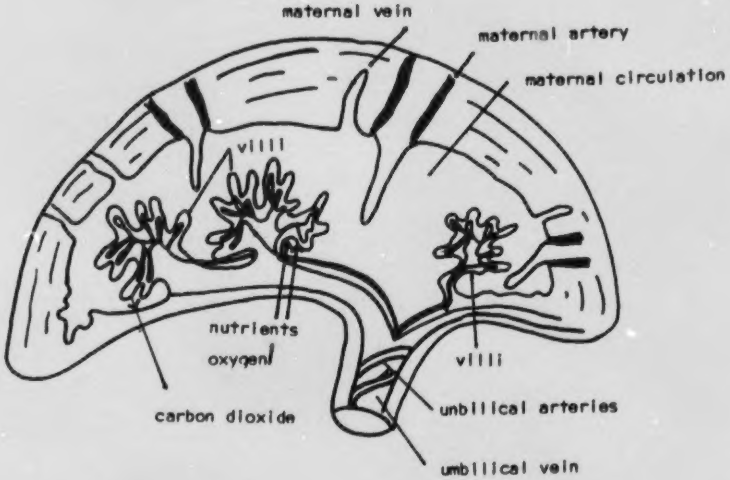
Month 8 ____

The child must remain in the womb for these refinements and weight gain for the optimum transition to the outside world.

Month 9 ____BIRTH!!

Figure 10 illustrates the tie between the outside world and the unborn child bringing to it both healthy and unhealthy aspects of the internal and external environment. The baby and mother interact through the mother's and its own bloodstream, never mixing but coming in such close contact that diffusion between the two blood systems readily take place enabling the cells that are developing in this nine month journey to eat, breathe, burn fuel, make repairs, reproduce and eliminate waste.

Figure 10. Interaction system between the mother and unborn child in the Placenta.



1. When the developing cells are a Morula at the second day after conception the organism is so small that it has not formed the placental system illustrated so nutrients, oxygen and carbon dioxide pass through its surrounding membranes and out of its cells like a sponge soaking up and releasing fluid.

2. The Blastocyst at four or five days receives nutrients, oxygen and returns carbon dioxide via the mother's blood stream through her tiny capillaries surrounding the Blastocyst.

3. The embryo's heart at the sixth week pumps blood around itself. The tiny capillaries of the mother come into direct contact with all of the growing embryo's cells and diffusion takes place between the embryo's cells and tiny capillaries of the mother exchanging carbon dioxide for oxygen and nutrients.

4. In the fourth month the unborn child's umbilical cord, the bridge from mother to child and the placental system, the life sustaining exchange site lining the womb, is well established. The umbilical cord houses two large arteries to take blood away from the baby and one vein to bring blood back to the baby. The umbilical arteries and vein whisk the baby's blood on a round trip from its body to the placenta where the new oxygen and nutrient supply are obtained for the baby and carbon dioxide and eliminations of the child are sent out through the mother's system.

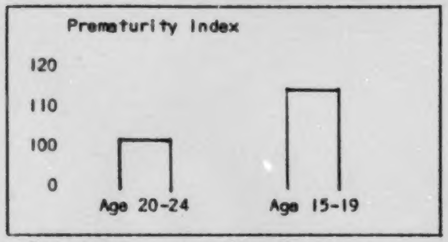
"A Premature or Small for Gestational Age Infant"

A premature infant, denoting an infant born after less than thirty-seven weeks in the uterus, or a small for gestational age infant, meaning an infant born full term but under 5½ pounds, may both have causation factors which have root in the teenage years. Eight percent of all infants are born prematurely. Low birth weight is two times as high among teenage mothers.

Two factors seem to be causative in premature infants born to teenagers:

1. Very young women are biologically too immature for effective childbearing. Prenatal care, no matter how comprehensive appears to be unable to ensure the same prematurity rates sustained by older women. Figure 11 illustrates this point.

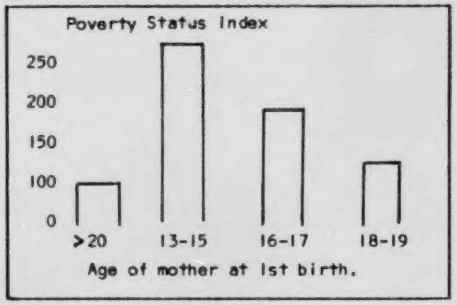
Figure 11. The risk of prematurity to 15-19 year old mothers having a first child compared to 20-24 year old mothers having their first child. United States, 1960's.



*Adapted from 11 Million Teenagers

2. The lower the age of the teenage mother the greater the risk that the baby will be born into a family of poverty. Figure 12 illustrates this point. Thirty percent of women who live in poverty need special help for complications of pregnancy and childbirth. This poverty group also births premature children three times more often than the middle class mother.

Figure 12. Risk of poverty among families where the mother initiated childbearing in her teens compared to the mother giving birth at 20 or older. United States, 1967.



*Adapted from 11 Million Teenagers

Why the concern for prematurity in the infant of teenage parents?

... Three fourths of all premature children weighing less than three pounds develop physical or mental defects.

... The lower the birth weight the higher the risk of brain damage and mental retardation.

... The prevalence of the premature in institutions for the mentally retarded is more than two times as high as the prematurity rate in the general population.

... Two thirds of infants born under 5½ pounds sustain mental or emotional handicaps in infancy or childhood.

... Low birth weight children as a group have increased risk in having one of or a combination of the following:
1. vision and hearing problems
2. cerebral palsy
3. epilepsy
4. mental retardation
5. physical handicaps
6. behavioral problems
7. infant and childhood injuries
8. birth injuries

In other words being born small or prematurely is dangerous. Why?

The full size infant:	must make the transition ⇨	with:
over 5½ pounds and/or a gestation of at least 266 days	and adjustment to life outside the uterus	a healthy development during 9 months of growth and/or with the insulation of fat and tissue plus lung and brain refinements.

*This infant has a greater chance for good transition and adjustment, and is less susceptible to the dangers of labor and birth.

The under size infant:	must make the transition	without:
under 5½ pounds and/or a gestation of under 266 days	→ and adjustment to life outside the uterus	a healthy development during the 9 months of growth and/or without the insulation of fat and tissue plus lung and brain refinements.

*This infant is handicapped in the transition and adjustment and is more susceptible to the dangers of labor and birth.

The problems in prematurity have become more acute in recent years because of the notable increase in the survival rate for infants of very low birth weight, under three pounds.

INGREDIENTS OF TEEN PREVENTION RESPONSIBILITY

Ingredient #1: Mature Biological Childbearing.
Young women, too biologically immature for effective, full term childbearing should be encouraged to defer pregnancy to the optimum childbearing age range from 20 to 35 years of age which is also a time when the mother and father would more likely be financially secure enough to provide adequate medical care to the mother and infant.

Ingredient #2: Adequate Nutrition of the Parents.
A major factor contributing to low birth weight appears to be inadequate and improper nutritional intake during pregnancy and well before. A growing body of evidence suggests that malnutrition before pregnancy can cause mental retardation. What a young girl eats may well have an effect on the kind of pregnancy she will have years from now. Three factors seem to be important:

1. Those who are poorly nourished before pregnancy tend to carry their poor nutritional habits into pregnancy. It may be too late to make up for chronically poor nutrition after a girl or woman is pregnant. Ample studies have shown that the mother's nutritional status before pregnancy is at least as important as what she eats during pregnancy.

2. Pregnancy during the teenage years depletes reserves needed for the teenager's own growth.

3. The husband or father has the greatest influence in bringing about changing food choices in the pregnant girl or woman to break poor nutritional habits.

It is well established that the basic needs of teenagers are greater than those of young adults. This time of growth and maturation places special demands on them. The combination of these growth and maturation needs plus those of the unborn baby of the teenager is potentially risky.

Good or poor nutrition results from choosing certain foods over others and having an inadequate or adequate diet over long periods of time. In a land of plenty Americans many times eat too many of the wrong things or too little of the right. The foods a teenager eats must build his growing, maturing body today and for a life time. Figure 13 summarizes the function, source and recommended daily diet for teenagers of the major nutrients.

Figure 13. Major Nutrients, Their Function, Source and Recommended Daily Diet for the Teenager.

Major Nutrients	Function	Sources	Recommended Teenage Diet
Protein	Block builder of 24 amnio acids which form enzymes. Enzymes control body processes and chemical reactions. Component of hemoglobin in red blood cells which carries oxygen to the entire body. Component of antibodies that fight infection. Builds muscle tissue to hold bones together and give strength.	meat fish eggs poultry milk cheese bread cereal vegetables: beans peas peanuts	Breakfast fresh orange juice whole grain cereal with milk whole grain toast with margarine glass of milk
Fats	Provide energy and fuel. Add flavor and satiety to foods. Component of cell and membrane structure. Carry vitamins A, D, E, K to facilitate absorption. Cushioning protection for organs.	bacon butter shortening margarine salad oil cream cheeses salad dressing nuts	
Carbohydrates	Starches and sugars provide a major source of energy.	cereal grains fruits vegetables sugar	
Fiber	Remains in the intestinal tract where it aids in digestion and elimination of waste.	whole grains: bread cereal	

Figure 13. Major Nutrients, Their Function, Source and Recommended Daily Diet for the Teenager. (continued)

Major Nutrients	Function	Sources	Recommended Teenage Diet
Water	Necessary for all processes of digestion. Nutrients are dissolved in water to pass through the intestinal wall and carries waste out of the body. Regulates body temperature.	water we drink by-product of body burning food energy milk fruit juices vegetables fruit meat	Lunch vegetable soup meat and lettuce sandwich using whole grain bread peach and cottage cheese salad glass of milk pudding
Minerals: calcium	Formation of bones, teeth and muscle tissue. Function of central nervous system. Maintenance of body fluid levels.	milk dark green, leafy vegetables	
Iron	Component of hemoglobin in red blood cells that carry oxygen to the body.	liver kidney heart lean meat shell fish whole grains dark green, leafy vegetables	
Iodine	Thyroid function.	iodized salt seafood	

Figure 13. Major Nutrients, Their Function, Source and Recommended Daily Diet for the Teenager. (continued)

Major Nutrients	Function	Sources	Recommended Teenage Diet
Major Minerals: zinc copper potassium magnesium phosphorous sodium Minor Minerals: copper selenium cobalt chromium manganese	Structure of all body tissues. Regulation of body functions.	milk dairy products a balance of other major nutrients	Dinner London Broil green beans rice tossed salad glass of milk fruit pie
Vitamins: A	Eye function. Keeps skin and mucous membranes resistant to infection.	animal products deep yellow and dark green vegetables and fruits	
B riboflavin	Releases energy in our food. Sustains healthy skin. Keeps the digestive system and central nervous system functional.	meats milk whole grains organ meat	
thiamin	Function of sensory nerves.	lean pork beans and peas organ meat some nuts whole grains	

Figure 13. Major Nutrients, Their Function, Source and Recommended Daily Diet for the Teenager. (continued)

Major Nutrients	Function	Sources	Recommended Teenage Diet
niacin	An essential component of enzymes which release energy in the body.	whole grains meat peas beans	Evening Snack milk whole grain cookie apple
B_6, B_{12}	Keeps central nervous system in working order. Maintains normal hemoglobin to carry oxygen to the tissues.	animal products	
C	Maintains the cementing material that holds the body together.	fresh fruit juice fresh fruits & vegetables	
D	Builds bones and teeth. Important to calcium and phosphorous absorption.	fruits vegetable oil	
E	Protects cells from destructive forces of chemicals and environmental oxidants.	margarine wheat germ milk meat eggs	
K	Maintains normal clotting of blood.	green, leafy vegetables eggs liver	

Ingredient #3: Immunization Against Rubella

Infections both before and after birth are responsible for 4 - 9% of institutionalized mentally retarded children. In one year, 1963-64, 20,000 were impaired by congenital infections alone. Some congenital infections may be prevented long before a woman or girl becomes pregnant.

Immunity to a disease produced by a vaccine either injected or swallowed creates antibodies. These antibodies resist specific disease germs when they enter the body. For strong resistance to certain diseases it is necessary to reinforce first vaccinations with boosters at definite times. In 1974, President Ford spoke nationally to this point:

> ***The President's Committee on Mental Retardation has brought to my attention an alarming decline of immunity levels among pre-school children. Last year more than 40% of these children were unprotected against either polio, measles, Rubella, diptheria, pertussis or tetanus.***

Thirty percent of U.S. children are not immunized against Rubella. If a teenage boy or girl has not been immunized they should do so to:

1. Keep the possibility of spreading the disease down.
2. Protect the women and girls at childbearing age.

A woman or girl should not be immunized if:

1. She is pregnant.
2. Pregnancy is a possibility-without pregnancy testing.
3. She plans on becoming pregnant within three months after immunization.

A mother often is not aware that she has German Measles or Rubella because the signs are not dramatic. The infection passes thru the placenta and spreads throughout the baby. Fifty percent of infants infected congenitally during the first or second trimester are born defective. Rubella infection can cause cataracts, heart defects, deafness, blindness, mental retardation and microcephaly. The development of the Rubella immunization program is outlined in Figure 14.

Figure 14. The Development of Rubella Immunization

1940	A Rubella epidemic in the U.S.
1941	Dr. McAllister Gregg, an opthamologist, noted an increased incidence of cataracts in infants. This initiated an exploration of causation factors.
1950	Rubella is known to be a crippler of the unborn.
1960	A Rubella epidemic in the U.S. results in 50,000 deaths or birth defects.
1963-64	2.8 billion is spent on the care and education of Rubella children.
1966	A blood test is developed to determine if an individual carries immunity fo Rubella.
1969	A Rubella vaccine is developed.
1970	A Rubella epidemic is forecast. A mass immunization program is carried out in the United States.
1974	30% of U.S. children remain unprotected against Rubella.

Over 3,700 newborns are impaired each year from Cytomegalovirus, a member of the Herpes family. It ranks as the #1 microbiological cause of congenital brain damage in infants. 1.5% of severely retarded individuals are caused by Cytomegalovirus. It is devastating to the unborn infecting the child either congenitally or in the birth canal causing organ defects, bone damage, microcephaly, mental retardation, blindness, deafness, convulsions and cerebral calcifications.

Forty-five percent of all women may be susceptible to Cytomegalovirus. Maternal infection runs as high as 6% of all pregnancies with infection of the unborn in a fraction of these cases. The virus can be latent in the mother and reactivated by the stress of pregnancy. The infant may have no symptoms at birth but develop noticeable symptoms at two years of age.

Prevention may be possible in the near future by vaccinating adolescent girls. A vaccine is currently being developed.

Ingredient #4. Avoiding Infection by Syphilis and Herpes Simplex II and Seeking Diagnosis and Treatment for Possible Syphilis Infection.

Syphilis now ranks among the most common of communicable disease. It's prevalence continues to grow:

1957 6,251 cases in the U.S.
1970 20,000 cases in the U.S.
1976 80,000 cases in the U.S.

Syphilis is a killer and crippler of unborn babies. It is transmitted by an infected mother through the placenta after the 14th to 18th week of pregnancy and in the birth canal from the mother's active sores. It invades all the baby's organs in a very damaging array causing emaciation, blister sores over the infant's body, anemia, hydrocephalous, bone and cartilage malformation, enlarged liver and spleen, pneumonia, meningitis and kidney disease. In the growing child it can emerge after a latent period causing blindness, deafness, disfiguring sores and scarred skin, heart defects, mental retardation, mental illness, misshapen teeth, nerve damage, paralysis and convulsions.

Syphilis can go undetected for it has few outstanding signs in the early stages in the adult; ulcerations on the external sex organs and a rash. Then the disease goes into a latent stage emerging later in adulthood with some of the dramatic effects it has on the unborn and developing child. It must be diagnosed by a blood test if the possibility of infection exists and treated with penicillin before it can effect the unborn child and ravage the mother and father.

Herpes Simplex Virus II (HSVII) is the second most common venereal disease in the United States being two times as prevalent as syphilis. It is also uncurable.

The infant is infected in the uterus or as he or she passes through the birth canal. If the infant survives it will have a 60-80% chance of having a neurological defect. Effects of the infection on the unborn are abnormalities of the blood, liver and adrenal gland, brain calcifications, convulsions and lesions of the skin and genitals.

After an initial attack the Herpes Virus is able to live in a dormant state in the nerve endings until stress brings on another attack. Herpes Simplex is as of yet incurable so avoidance of careless sexual practices is the only prevention.

Ingredient #5: Sexual Responsibility to Bring the Cervix to Maturity in a Healthy Condition.

Injury to the cervical tissue in girls engaging in early and frequent sexual intercourse between 13 and 19 has become an increasing problem in pregnancy. A cervix scarred by repeated healing of lesions caused by such intercourse puts the baby at risk because of the difficulty a scarred cervix has in carrying a baby to full term.

Prevention lies in the postponement of sexual intercourse until the girl or woman's body is biologically mature.

Ingredient #6: Control of Your Own Life in Relation to Drugs, Self Medication, Alcohol and Smoking.

An about face in the use of drugs, self medication, alcohol and smoking must come well before a woman or girl finds out she is pregnant. Most organs of the unborn child are well under way to full development before a woman suspects that she's pregnant. Many drugs do their harm during those critical first weeks of the unborn's development. Limited use or giving up drugs must become a way of life from the moment a pregnancy, accidental or planned, becomes a reality.

Figure 15 compares the percentage of women who said they would change their smoking, alcohol and self medication practices compared with those who actually changed. It is based on 134 women.

Figure 15. Percentage of women who said they would change their smoking, alcohol and self medication practices in pregnancy compared with those who actually changed when becoming pregnant.

Practices	% who expected to change	% carrying out such a change
Smoking	72	58
Alcohol	65	79
Self Medication	90	95

*Adapted from A Study of Health Educational Aspects of Smoking in Pregnancy by Leo Barle and others.

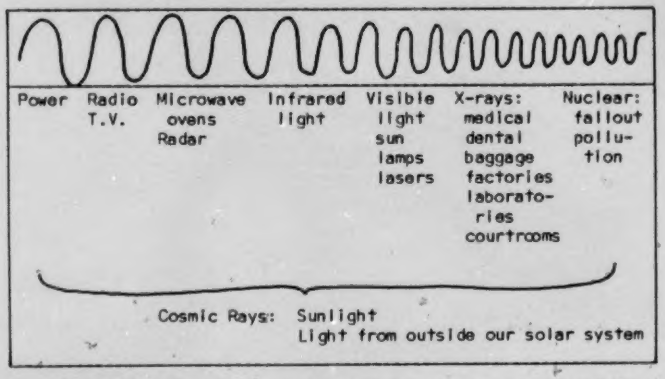
Ingredient #7: Keeping Radiation from Medical and Dental Sources to a Minimum to Decrease the Possibility of Gene and Chromosome Damage.

The amount of radiation needed for gene mutation is low. If damaged egg or sperm cells are later used in conception the damage is passed on to all the child's cells including those which will later become sperm or egg cells. The original damage can be transmitted through many generations with some genetic changes in reproductive cells of the parents being seen in the first generation of their offspring while others may be passed on undetected for several generations before producing apparent effects. Radiation exposure and its effects on the body cells is definitely a long term ball game!

Radiation Is

energy moving through space as invisible waves. The number of waves per second help determine what the radiation is like and how it effects people. Figure 16 illustrates in a simplistic way the various sources of radiation that bombard our body from the natural environment, medical and dental diagnosis and treatment and the industrial environment.

Figure 16. Radiation Sources


Power
Radio T.V.
Microwave ovens Radar
Infrared light
Visible light sun lamps lasers
X-rays: medical dental baggage factories laboratories courtrooms
Nuclear: fallout pollution
Cosmic Rays: Sunlight
Light from outside our solar system

Since 1899 the use of x-rays has grown as has the knowledge of their destructive power. Each year in the United States 130 million people undergo some kind of x-ray examination. There are perhaps 250-800 people per 20 million that are severely affected by x-rays per year. That's only .004 percent. And yet there is no known radiation (of the x-ray type) below which it can be said that no adverse health effects occur.

Figure 17 gives radiation exposure sources and rates for one generation's sex cells in RADS which is a measure or unit of absorbed radiation. Death results when the whole body is exposed to 500-600 RADS for a very short period of time.

Figure 17. Radiation exposure of one generation's sex cells from natural, medical and atomic sources.

RADS	Source
3 RADS / Generation	Natural Environment
3 RADS / Generation	Medical Environment
3 RADS / Generation	Atomic Environment

The risks of radiation must of course be balanced with the benefits but the risks must be realized as part of the picture. Figure 18 gives such a picture.

Figure 18. Benefits and risks from radiation.

Benefits	Risks
- The detection and treatment of disease: x-rays. - Research: isotopes and lasers. - Communications: T.V., radio, radar, lasers. - Atomic power: nuclear reactors. - Household conveniences: light, microwave ovens, ultrasonic cleaners, smoke detectors.	- Gene and chromosome damage: x-rays. - Fetal damage and disruption, mutation: x-rays. - Microwaves: cataracts, sterility, central nervous system damage. - Skin cancer: Ultra violet - Tissue destruction, loss of hearing: ultra sound.

How can the teenager cut down on the exposure of his or her cells containing genes and chromosomes to radiation?

1. The American Dental Association has said that x-ray examination should not be a standard part of every dental examination.
2. Do not insist on either medical or dental x-rays.
3. Tell the doctor or dentist about previous x-rays.
4. Males in particular, because his sex organs are subject to greater exposure, (but also females) including children, should be protected from radiation with lead aprons or shields in dental or medical x-rays. The Federal Drug Administration estimates that there are 5.5 million x-rays of male adults and children annually for whom the use of a shield would be appropriate.

5. The Federal Drug Administration opposes continued use of TB x-ray screening programs because there are more effective means (the Tine Skin Test) to diagnose TB.
6. A pregnancy test should always be done before diagnostic or treatment x-raying if there is any possibility that the girl or woman being treated is pregnant.

It is amazing the number of "teen ingredients" that go into preparing healthy potential parents. It is a paradox that in the teenage years which are relatively free from responsibilities that so many responsibilities must be taken to prevent or lessen the possibility of mental retardation in the next generation.

110

Pretest

Cognitive

1. The quality of life of a child begins at
   ____a. birth
   ____b. conception
   ____c. the fourth month after conception

2. ________ specific responsibilities may be taken by the teenager, both male and female, to help prevent or lessen the possibility of mental retardation in their child or children in the future.
   ____a. several
   ____b. few
   ____c. many

3. Babies born to a teenage mother are ___ times as likely to be born prematurely as to mothers over 19.
   ____a. 2
   ____b. 4
   ____c. 6

4. Prematurity may be caused by
   ____a. a biologically immature mother and poor nutrition in the mother
   ____b. infection and venereal disease
   ____c. all of the above

5. A premature baby or a baby that is small for birth has _____ chance than the baby born after 9 months in the womb or born over 5½ pounds of being born with defects including mental retardation.
   ____a. a greater
   ____b. the same
   ____c. a smaller

6. The optimum years for child bearing are
   ____a. 19 to 25
   ____b. 20 to 35
   ____c. 25 to 35

7. The unborn baby puts an exceptional nutritional strain on the teenage mother because
   ____a. the teenage girl now has the nutritional demands of her own growth and the demands growth of the unborn child add to her system.
   ____b. the teenager is undernourished.
   ____c. neither of the above.

8. Changing a diet which is inadequate in calories and nutrients to one which is adequate in both when a girl finds out she is pregnant
   ____a. is soon enough to protect the unborn baby.
   ____b. may be too late to protect the unborn baby.
   ____c. will have no effect on either the unborn baby or the mother.

9. An infection which is devastating to the unborn child but which may be prevented or lessened by immunization of the mother is
   ____a. Rubella
   ____b. Cytomegalovirus
   ____c. Syphilis

10. The second most common venereal disease in the U.S. causing mental retardation and one for which there is no cure is
    ____a. Syphilis
    ____b. Herpes Simplex
    ____c. Gonorrhea

11. Teenagers should limit their own exposure to medical and dental x-rays because it may cause
    ____a. skin lacerations
    ____b. damage to sex cell genes and chromosomes
    ____c. hearing problems

12. Excessive exposure of the sex cells throughout child and adulthood can be reduced by
    ____a. proper shielding of the sex organs when receiving dental or medical x-rays.
    ____b. using previous x-rays for diagnosis when at all possible.
    ____c. both of the above.

13. Early and frequent sexual intercourse in the teen years can cause premature birth of a baby conceived in subsequent years by
    ____a. lesions in the cervix which make it unable to do its job of retaining the baby for 9 months
    ____b. venereal disease in the mother and subsequent infection of the unborn child
    ____c. either of the above

Key: 1.b, 2.c, 3.a, 4.c, 5.a, 6.b, 7.a, 8.b, 9.a, 10.b, 11.b, 12.c, 13.a.

Affect Barometer

Circle the word or words which best represent the intensity of your feelings.

1. The health and "wholeness" of a baby starts before birth.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

2. The health, nutrition and sexual responsibility of the teenager effects the future of their potential children.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

3. To prevent or lessen the possibility of mental retardation in my own children I feel it is important for me as a teenager to:

a. limit childbearing to 20-35 years of age.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

b. be sexually responsible.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

c. avoid the possibility of venereal infections.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

d. be tested for venereal disease if there is a possibility I may have it and be treated if necessary.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

e. be immunized against Rubella.

--	-	0	+	++
strongly diagreee	disagree	neutral	agree	strongly agree

f. have an adequate diet in calories and nutrients.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

g. be in control of my life in relation to drugs, alcohol, self medication and smoking.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

h. avoid excessive x-rays for medical and dental diagnosis and treatment.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

i. have my sex organs shielded when I am being x-rayed.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

j. (Girls only) obtain regular cervix examination and repair if involved frequently in sexual intercourse in the teen years.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

Mini-Lecture or Presentation

"The Quality of Life Starts Before Birth"

Instructor: One of the great excitements as well as one of the great difficulties in being a teenager is SEX. It is

... a great discovery
... a great frustration
... a great pleasure
... a great conflict
... a great mystery and
... A GREAT RESPONSIBILITY

In the teen years the body of the male and female become capable of creating, shaping and supporting another human life. The quality of the egg, the quality of the sperm and the quality of the uterus are determined long before conception, in the teenage years and before. Let's take a dramatic look at that life you are capable of creating, shaping and supporting as it starts and travels through a miraculous yet extremely dangerous journey.

Student Involvement: The best way to give the students a feel for the miracle of the beginning of life and for a feeling and awareness that the quality of life begins before birth is to show a good film on fetal development. Recommended are numbers 2. a. 1, 2, 3, 4 or 5 from the classroom experience options.

If the showing of one of these films is not possible The Narration of Fetal Development which can be prepared from ditto 16,17 and 18 and transparencies 1-9 can be read aloud by students. The students should stand in 3 groups to represent the 3 trimesters of fetal development and growth. Encourage them to be dramatic and expressive. Transparencies 1-9 can be used to illustrate each stage of the unborn child's development by placing them on an overhead projector as the students narrate the journey of development.

Instructor: (After a movie or the narration) The cells that we saw developing in this nine month journey must eat, breath, burn fuel, make repairs, reproduce and eliminate wastes. The baby and mother interact through the mother's and its own bloodstream, never mixing but coming in such close contact that diffusion between the two blood systems readily take place enabling the exchange of carbon dioxide from the baby, for nutrients and oxygen to the baby.

Before the fourth month the mother's capillaries surround all of the baby's cells and since the organism is so small oxygen and nutrients and carbon dioxide can pass out of and into its cells like a sponge soaking up and releasing fluid. (Illustrate with transparencies 10 and 11.)

As the heart of the infant pumps in the 6th week and the placental-umbilical system is laid down by the 12th week a bridge is established from the child to the mother to the outside world bringing to the unborn child both healthy and unhealthy aspects of the external environment. The umbilical cord houses two large arteries that whisk the blood laden with carbon dioxide and waste products away from the baby to the placenta, the life sustaining lining of the womb, where the new oxygen and nutrients are obtained from the mother. Carbon dioxide and waste products are given up to the mother's blood and are whisked out through the mother's system. The new nutrients and oxygen are taken back from the placenta via the umbilical cord vein.
(Illustrate with transparencies 12, 13, 14.)

How can you as a teenager help this miracle of life begin with every advantage . . . with all systems go . . . with high quality egg, sperm and uterine environment? There are eight "teenage ingredients" to prepare potentially healthy parents to create potentially healthy infants.

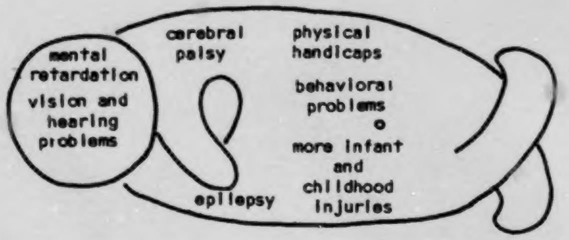
LET'S PUT IT ALL TOGETHER

A concept that is important to understand in the causation realm of mental retardation is prematurity or small for date of birth.

... a premature baby is one that is born before its nine months in the mother are up.
... a small for date child is one who has not prospered well in the mother for at least part of the nine months and therefore is born under 5½ pounds.

Why worry about infants being born less than 5½ pounds? Well, the lower the birth weight of an infant the higher the risk of brain disorders or mental retardation. In fact low birth weight children as a group have increased risks.

Student Involvement: Questions on the Premature Infant.
(Pass out "The Premature Infant" prepared from ditto 19.)



Ask the following questions:

1. What risks do premature babies have as a group?
2. Do you suppose every premature baby has all these defects?
3. Does every premature baby have at least one of these problems?
4. Is being born under 5½ pounds dangerous?
5. Why is a baby under 5½ pounds in greater danger during the birth process?

Answers to these questions, if you have any doubts, are in the background material for the teacher.

Instructor: Being born under 5½ pounds may have causation factors which are rooted in the teenage years. Low birth weight is twice as high among teenage girls as in girls over 20. As we put together the teen ingredients of a responsible parent all factors relating to prematurity will be starred.

(Put together the teen ingredients from transparencies 15-22 as the rest of this class session progresses.) Note that both the male and female carry the responsibility in almost all of the teen ingredients. This is why the male-female outlines are used. This double responsibility should be stressed.

Student Involvement: Mini-Opinion Poll
*How many of the girls feel that the teenager is biologically ready for childbearing?

Teen Ingredient #1:
The mother's body must be biologically mature to carry the unborn child the full nine months. The teenage mother will put her baby at risk because her baby will be twice as likely to be born prematurely as compared to a mother twenty or older. The optimum childbearing age is from 20 to 35 years of age.

Student Involvement: Mini-Opinion Poll
*How many of you boys feel that you would not be able to afford medical care for an unborn child and mother during the teen years?

Teen Ingredient #2:
The mother and father must be financially able to pay for prenatal care for the mother and child to nurture the unborn child in conditions other than poverty.

Student Involvement: Mini-Opinion Poll
*How many of you feel that a teen's poor nutrition could cause mental retardation in a future child?

Teen Ingredient #3:
Good nutrition of the mother and encouragement of that good nutrition by the father contribute to birth weight in a future infant that is above the risk level and of optimum intellectual functioning. Teenage girls who are poorly nourished tend to carry their poor eating habits into pregnancy. Also, it may be too late to make up for chronically poor nutrition after a girl or woman becomes pregnant. The demands of a growing teenage body and an infant growing within that body puts a double stress on the mother nutritionally. The father has the greatest influence in bringing about changes in food choices in the pregnant woman to break poor nutritional habits.

Student Involvement: Mini-Opinion Poll
*How many of you have been immunized against Rubella?

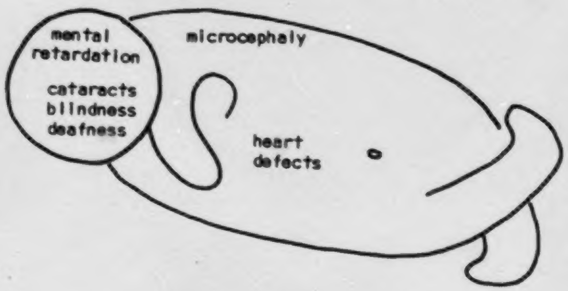
Teen Ingredient #4:
Immunization of both girls and boys against Rubella.
Infections both before and after birth are responsible for approximately 8% of institutionalized retarded children. Some infections passed from the mother to the infant either in the uterus or during birth can be prevented long before a woman or girl becomes pregnant. If a teenage boy or girl has not been immunized against Rubella, they should do so to:

1. Keep the possibility of spreading the disease down.
2. Protect the woman of childbearing age.

It is alarming and also dangerous to unborn children that 30% of all U.S. children have not received Rubella immunizations. A girl should not:

1. Be immunized if she is pregnant.
2. Become pregnant for 3 months after immunization.
3. Be immunized if pregnancy is a possibility-without pregnancy testing.

Student Involvement: Questions on the "Rubella Child".
(Pass out "The Rubella Child" prepared from ditto 20.)


mental retardation
microcephaly
cataracts
blindness
deafness
heart defects

Ask the following questions:

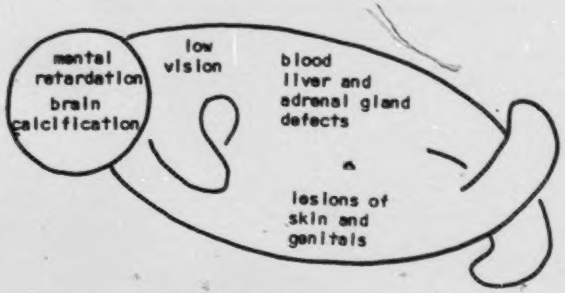
1. What defects can Rubella cause in the unborn infant?
2. Does the mother always know she has Rubella?
3. What is another common name for Rubella?
4. Is Rubella the same as the 3 day measles?
5. When do you think the Rubella infection is most dangerous for the unborn child?
6. How can you tell if you've been immunized against Rubella?

If you are in doubt about the answers to any of the questions they are in the background material.

Teen Ingredient #5:
Avoid contracting Syphilis and Herpes Simplex II. Seek diagnosis and treatment for Syphilis if the possibility of Syphilis exists.

Two venereal diseases can cause mental retardation in an infected infant. Herpes Simplex and Syphilis. Herpes Simplex is not only the second most common venereal disease in the United States, being two times more prevalent than Syphilis but is as of yet uncurable. So avoidance of careless sexual practices is the only mode of prevention with Herpes. After an initial attack it is able to live in a dormant state in the body until stress brings on another attack.

Student Involvement: Questions about the "Herpes Infant".
(Pass out the "Herpes Infant" prepared from ditto 21.)

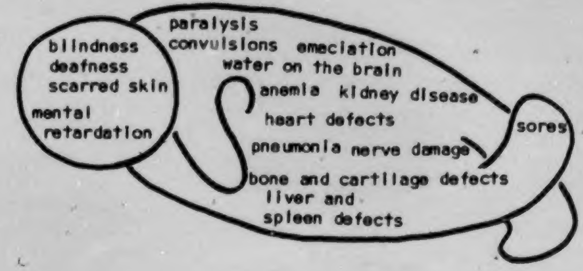

mental retardation
brain calcification
low vision
blood
liver and adrenal gland defects
lesions of skin and genitals

Ask the following questions:

1. The Herpes infected infant if he survives will be mentally impaired about 70% of the time. What other defects might the infant have?
2. How do you think this virus is transmitted to the infant? Can the father be responsible for infecting the child?

Syphilis is now the most common communicable disease in the United States with 80,000 new cases in 1976. Syphilis can go undetected in the adult for it has few dramatic signs. However, after a quiet or latent stage it emerges later in adulthood with some devastating effects . . . some of the same effects it has on the unborn child who's tissues and organs are very vulnerable to the infection. Syphilis must be diagnosed by a blood test and treated with penicillin before it can effect the unborn child and ravage the mother and father.

Student Involvement: Questions about the "Syphilitic Infant".
(Pass out the "Syphilitic Infant" prepared from ditto 22.)



Ask the following questions:

1. What does the killer and crippler of unborn babies do specifically to the infected newborn?
2. Can the father be responsible for the infected child?
3. How is Syphilis transmitted from the mother to the newborn?

If you have doubts about any of these questions the answers are in the background material.

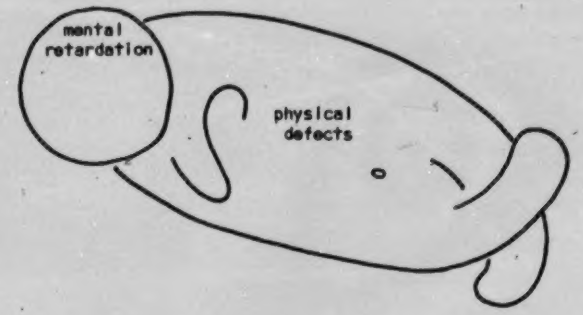
Teen Ingredient #6:
Sexual responsibility is necessary to bring the cervix to maturity in a healthy condition in the woman. Injury to the cervical tissue, the lower neck-like part of the uterus, in girls engaging in early and frequent sexual intercourse between 13 and 19 years of age has become an increasing problem in pregnancy. A cervix scarred by repeated healing of lesions caused by frequent intercourse at a young age puts the baby at risk because of the difficulty such a cervix has in carrying the baby a full nine months.

Student Involvement: Mini-Opinion Poll.
"How many of you prop a newborn baby with a martini and a cigarette and give him aspirin for crying? Of course you would'n't. Chronic alcoholism or alcoholic binges, smoking and self medication are all potentially dangerous to the unborn child.

Teen Ingredient #7:
Be in control of your own life in relation to drugs, self medication, alcohol and smoking. In a study of pregnant women only about half of them could stop smoking even though 3/4 of them wanted to for the sake of their unborn child. Of those wanting to give up alcohol, 3/4 of them did a little better with 65% being successful. Stopping self medication proved to be the easiest to accomplish with practically all of the 95% who wished to give up this practice being successful.

An about face in the use of these drugs when a woman finds she is pregnant is not always easy or possible. Besides many dangerous drugs do their harm during the critical beginning weeks of the developing embryo when the woman does not even know that she is pregnant.

__Student Involvement:__ Questions on the "Drugged Infant".
(Pass out the "Drugged Infant" prepared from ditto 23.)



Ask the following questions:

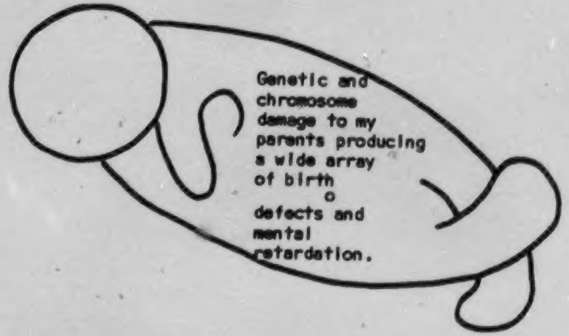
1. What damage can smoking and drinking do to the unborn child?
2. Is the unborn infant protected from drugs entering his bloodstream?
3. What responsibility does the father have in seeing that his child is not drugged?

__Student Involvement:__ Mini-Opinion Poll.
"How many of you have had x-rays within the past five years?

Teen Ingredient #8:
Radiation from medical and dental sources (x-rays) must be kept to a minimum to decrease the possibility of gene and chromosome damage. The amount of radiation needed to cause gene mutation is low. If damaged egg or sperm cells are later used in conception the damage is passed on to all the child's cells including those which will later become sperm or egg cells. The original damage can be transmitted through many generations with some genetic changes in reproductive cells of the parents being seen in the first generation of their offspring while others may be passed on undetected for several generations before producing effects. Scarey isn't it?

Roentgen, inventor of the x-ray died of his own invention. Since Roentgen's discovery in 1895 the use of x-rays has become excessive. Each year 130 million people in the U.S. undergo x-ray examination. We are bombarded with radiation from the sun, outer solar system, atomic fallout, medical and dental x-rays and industrial sources. The risks of radiation must be balanced with the benefits but the risks must be realized as part of the whole picture.

__Student Involvement:__ Questions on the "Unborn Child of Irradiated Parents" (Prepare from ditto 24.)


Genetic and chromosome damage to my parents producing a wide array of birth defects and mental retardation.

Ask the following questions:

1. How can x-ray exposure to potential parents in their childhood and teenage years cause mental retardation in a child born to them many years later?
2. Why should the male teen have a greater responsibility in protecting himself than the female?

If in doubt about the answers consult the background material.

The teenager can cut down on exposure to x-rays by:

1. Following the American Dental Association's guidelines of not having x-rays as a routine part of every dental examination.
2. Not insisting on dental or medical x-rays.
3. Telling the doctor and dentist about previous x-rays.
4. Requesting lead shields or lead aprons to protect the sex organs during all x-ray procedures. (Especially males since their sex organs are subject to greater exposure.)

5. Not patronizing x-ray T.B. screening programs. Skin tests are more effective.
6. Requesting a pregnancy test (girls only!) before x-raying if there is any possibility that you may be pregnant.

☐ Classroom Experience Options

1. General:
   a. Show the film Tomorrow Happens Today.
      Time: 20 minutes color filmstrip
      Content: Explores factors which may effect the unborn child, causing him to be born with less than his full potential for life. Discusses VD, diet, maternal age, virus and drugs.
      Available from: ⊛ #14 Free
   b. Have the class develop a directory of community resources necessary to implement the "teen ingredients" of prevention.
   c. Present a panel of handicapped people with cerebral palsy, hearing problems and visual impairments to communicate to students how a birth defect has effected their lives.
   d. Use pamphlets for introduction or emphasis:
      1. Be Good To Your Baby Before It's Born 9-0002 ⬡ #20
      2. Birth Defects: Questions and Answers ⬡ #20
2. Prenatal Development:
   a. Show one of the following films:
      1. Title: Genesis, The Origins of Human Life
         Time: 3 minutes color film high school
         Content: Making use of the unique photographic methods of famed Swedish science photographer Lennart Nilsson, these remarkable films show the origins and development of human life.
         Available from: ⊛ #15 Rental $25 for 3 days.
      2. Title: Fertilization
         Time: 3 minutes color film high school
         Content: Mystery of the origins of human life are described simply. Narration is in form of a father-son discussion on where babies come from. The father describes the formation of egg and sperm and fertilization process.
         Available from: ⊛ #15 Rental $25 for 3 days.
      3. Title: Development
         Time: 3 minutes color film high school
         Content: The father-son dialogue is again used describing development of the embryo and fetus. Step by step developments clearly explained and photographed.
         Available from: ⊛ #15 Rental $25 for 3 days.
      4. Title: Prenatal Development
         Time: 23 minutes color film junior/senior high school
         Content: Traces the formation and development of the human embryo and fetus, interspersed with examples of the influence the prenatal environment can have on the developing fetus. A mother's deficient diet is one factor of importance and its potential effect on the development of the fetal brain is focused on.
         Available from: ⊛ #8 Rental $35
      5. Title: How Life Begins NSC-1204
         Time: 47 minutes color film-1968 junior/senior high school
         Content: Relates how life begins from the union of a sperm and egg and carries through to the zygote, blastula and gastrula stages of embryonic development emphasizing cellular division and differentiation. Specifies the requirement that separate the living and non-living. Shows the birth of a puppy, calf and human baby.
         Available from: ⊛ #11 Rental $15.75
3. Teenage Parenthood:
   a. Invite a parent who has had a premature baby to speak to the class on the problems involved in prematurity for the parents and the child.
   b. Have a panel of teenage parents discuss the joys and problems of parenthood.
   c. Show or listen to:
      1. Pregnant Man Program
         Color slides
         Content: Discuss the concept of "would you be more careful if this could happen to you?"
         Available from: ⊛ #14 Free
      2. Being a Parent by Dr. Lee Salk
         Cassette tapes - junior/senior high school
         Time: 20 minutes
         Content: Dr. Salk talks in a very straightforward way about pregnancy, childbirth and the newborns.
         Available from: ⊛ #9 Free
      3. Contraception (only if permissable in your school corporation)
         Time: 20 minutes color slides and cassette tape high school
         Content: Explains 6 types of contraceptives and how they work. Also gives the side effects of the 6 types.
         Available from: ⊛ #9 Free

d. Have a parent speak on the costs involved in raising a normal child and one who is mentally retarded.

4. Venereal Disease:
   a. Show one of the following films:

      1. Title: A Half Million Teenagers
         Time: 15 minutes color film junior/senior high school
         Content: Discusses the prevalence of venereal disease, especially among teenagers and emphasizes the need for recognition of symptoms and prompt treatment. Describes the symptoms of Syphilis and Gonorrhea in the male and female.
         Available from: ⊗ #11 Rental $9.25

      2. Title: The Lunatic
         Time: 23 minutes color film 1972 junior/senior high school
         Content: Explores the emotional effects contacting venereal disease has on two college students. Dramatized Jenny and Richard's relationship, their attitudes, emotions and contemporary life styles through stream of consciousness techniques and contemporary music. Concludes with Jenny seeking medical help and Richard refusing to do so.
         Available from: ⊗ #11 Rental $12.50

   b. Give out and discuss pamphlets:

      1. Venereal Diseases and Birth Defects 4-0014

      2. Venereal Disease and Birth Defect Prevention 9-0101

      3. Leader's Alert Bulletin 28, Venereal Disease and Birth Defects

         All available from: ⬡ #20 Free

   c. Discuss in small groups how social attitudes toward venereal disease effect the prevention and spread of the diseases.
   d. Role play why young men or women do not want to go for VD testing.

5. Nutrition
   a. Show a good film on nutrition:

      1. Title: The Human Body: Nutrition and Metabolism
         Time: 14 minutes color film junior/senior high school
         Content: Explains basal metabolism and nutrition through live action.
         Available from: ⊗ #11 Rental: $8.50

      2. Title: Balance Your Diet for Health and Appearance
         Time: 11 minutes color film junior high school
         Content: By comparing the diets of three teenagers the importance of a balanced diet is explained.
         Available from: ⊗ #12 Free

      3. Title: Food: A Super Natural Resource
         Time: 20 minutes junior/senior high school
         Content: Helps students identify their values about personal eating habits, food purchases and nutrition. Provides information needed to make intelligent choices.
         Available from: ⊗ #13 Free

      4. Title: The Real Singing Action Movie About Nutrition
         Time: 14 minutes color film junior high school
         Content: A junior high school class makes its own film about nutrition. With kids talking to kids, they tell it the way it is without preaching. Emphasis on making your own choice. Done in a fun-to-watch vein with serious points concerning food habits.
         Available from: ⊗ #13 Free

      5. Title: The Food Platform
         Time: 20 minutes color film junior high school
         Content: Presents the basics of proper diet and nutrition. A political rally of Internal Consumption Convention has hundreds of young people taking the parts of body cells and meet within the body to select a diet.
         Available from: ⊗ #13 Free

      6. Title: Food For Life
         Time: 22 minutes color film junior/senior high school
         Content: Explains how various forms of malnutrition are caused and what can be done to prevent them. Compares food practices of four teenagers of Central America, India and the United States. It offers students a responsible basis for understanding the vital connection between how they eat and their physical well-being.
         Available from: ⊗ #13 Free

7. Title: Your Food: Chance or Choice
Time: 13 minutes filmstrip junior/senior high school
Content: Introduces principles of decision making and illustrates how the teenager can apply them to food selection analyzing the nutritional adequacy of the choices he makes.
Available from: ⊛ #13 Free

b. Give out and discuss pamphlets:

1. Creating Good Food Habits-Start Young-Never Quit

2. Smarten Up and Snack Right! Here's How To Book #3661
Both Available from: ⬡ #28

3. Food Choices: The Teenage Girl
Available from: ⬡ #28

4. Nutrition and Birth Defects 0-0028
Available from: ⬡ #20

c. Use poster display:

1. Your Snacks: Chance or Choice
B036 4 page leader guide 10¢
Available from: ⬡ #8

d. Use: Curriculum Guide for Health Education: Nutrition for a More Indepth Study of Nutrition Cost $12.50
Available from: ⬡ #20

e. Give a Nutritional Deprivation Demonstration or have a student or biology teacher demonstrate. Animal Feeding Demonstrations for The Classroom B050 60¢
Available from: ⬡ #8

6. Drugs:
a. Show:

1. Taking A Look At What We're Taking
75 slides/script or cassette Free
Content: Over the counter drugs, historical review and current products.
Available from: ⊜ #1

2. 2. Title: Trigger Film for Alcohol Education 3426
Time: 7 minutes each color 1975 junior high school
Content: Six films deal with alcohol to trigger discussion of different decision making procedures and different possible solutions.
Available from: ⊛ #12

3. Title: Drugs and The Nervous System
Time: 18 minutes color film junior/senior high school
Content: Discusses some basic, vital facts about misuse of airplane glue, stimulants, depressants, marijuana and LSD. Film focuses on changes of nervous system. Facts are presented without preaching or moralizing.
Available from: ⊛ #9

4. Title: Narcotics: The Inside Story CSC-1894
Time: 11 minutes color film junior/senior high school
Content: Explains how certain drugs or narcotics effect the central nervous system as depressants or stimulants. Illustrates some of the effects and dangers ascribed to the use of LSD and marijuana.

5. Title: LSD: Insight or Insanity? CS-1846
Time: 28 minutes color film junior/senior high school
Content: Emphasizes possible biological damage of the brain, chromosomes and for the pregnant women, malformations in offspring. Presents teenagers explaining their reason for taking LSD.
Available from: ⊛ #11 Rental: 4. $6.75 5. $12.00
4 and 5

b. Give out and discuss the pamphlet:

Unprepared Drugs and Birth Defects Prevention 9-0029
Available from: ⬡ #20

7. Immunization:
a. Have the students fill out an Immunization record for themselves. Available from: ⬡ #22
b. Role play: One class member must try to sell immunization against Rubella to another classmate who is very resistive.
c. Speaker: The mother of a Rubella child relates her own infection, pregnancy, birth story and some problems involved in raising a Rubella child. See ⬡ #21 for speaker contacts.
d. Give out and discuss the pamphlet:
Rubella Robs The Cradle 9-0008
Available from: ⬡ #20

8. Radiation:
   a. Show and discuss:

      1. X-RAYS How Safe?
         Color film junior/senior high school
         Content: Discusses the use of x-rays.
         Available from: #10 Free

      2. Radiation Protection During X-ray Examinations
         32 slides and script junior/senior high school
         Content: Proper technique used in Radiograph.

      3. Radiation: Physician and Patient
         Time: 45 minutes color film junior/senior high school
         Content: Discussion presented by the nation's most authoritative scientists and physicians of radiation exposure and protection in diagnostic radiology, the problems it presents and its biological effects.
         Available from: #10 Free
         # 2 & 3

   b. Use one or more pamphlets for discussion:

      1. We Want You To Know About Diagnostic X-rays
         DHEW Publication #(FDA) 73-8048

      2. X-rays: Focusing on Patient Protection
         DHEW Publication #(FDA) 76-8018

      3. X-raying Baggage to Thwart Skyjackers
         DHEW Publication #(FDA) 75-8008

      4. Reducing Genetic Risk From X-rays
         DHEW Publication #(FDA) 77-8019

      5. Radiation: Benefit vs. Risk
         DHEW Publication #(FDA) 75-8014

      All Available from: #6

   c. Speaker: A dental technician to talk about protective shielding in dental x-raying.
   d. Role Play: One student plays the part of a patient being x-rayed and wants protective shielding while another plays the part of a technician who feels it is unimportant to use protective shielding for the patient.

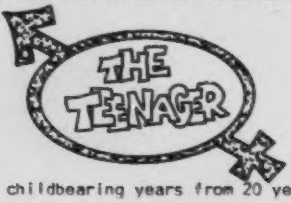
Outside Classroom Experience Options:

Outside experiences can be an introduction, reinforcement or extension of the material covered in the presentation. Such experiences are particularly important for the "Affect" experiences of the student.

1. Visit a home for unwed mothers for a talk by the director.
2. Visit a high risk infant nursery to observe the care and treatment of babies under 5½ pounds. (Only possible for students meeting hospital age requirements).
3. Visit a deaf-blind public school program where children with the multi-handicaps of Rubella infection are being educated.
4. Go to a Board of Health Clinic to observe how a Rubella serology and immunization are done.
5. Tour a Health Clinic to observe how venereal disease is diagnosed in the laboratory.
6. Have small groups of students tabulate the cost of birth and raising a child for one year in their own family.
7. Interview the head of an x-ray department in a hospital to determine what methods are being used to limit exposure of the public to needless or excessive x-raying.
8. Interview an airport official for documentation of Federal Drug Administration Inspection of Radiation Standards for baggage x-ray equipment effective April 10, 1975.
9. Have several students write to the Federal Drug Administration and The Environmental Protection Agency to determine what kind of standards and protection their agency provides for natural, industrial and medical radiation.
10. Visit a Head Start feeding program.

Action Checklist

Pass out an action checklist to each student prepared from ditto 25. Go over each point as a summary of the teen ingredients in the prevention of mental retardation. Encourage their action.



I will:

____ Limit the childbearing years from 20 years of age to 35 years of age.

____ Be sexually responsible.

____ Avoid venereal disease.

____ Be tested for venereal disease if infection is a possibility and obtain treatment if infected.

____ Be immunized against Rubella.

____ Eat foods that provide a diet adequate in calories and nutrients.

____ Be in control of your own life in relation to drugs, self medication, alcohol and smoking.

____ Avoid excessive or unnecessary x-rays for medical and dental diagnosis and treatment.

____ Request proper shielding of the sex organs when being x-rayed. (Particularly males!!)

____ (Girls only!) Request a pregnancy test before being x-rayed if there is any possibility that you are pregnant.

____ (Girls only!) Obtain regular cervical examinations by a gynecologist if involved in frequent sexual intercourse in the young teenage years.

____ Follow all recommendations for the man and woman, man and woman planning for a child, the pregnant woman and the father, the woman in labor and birth and the father, the mother and father of the newborn if you find yourself either a mother or father in the teen years.

Post Test

Give the same test used in the pretest. Let the students see how many answers that they did not know originally that they can now correct. Use as an in class or take home test. Determine the individual and class gains.

Ditto 16

"The Miracle and Danger of Development"

Instructor: As 100,000,000 sperm cells are propelled by their thrashing tails and swim upstream toward a single egg or ovum to merge to become a single unit the journey begins. Time and time again a flawless human being is created but occasionally the process goes awry. In ovulation the ovary releases the ovum or egg into the fallopian tube where the sperm must fertilize it within 1 to 3 days.

Group I

Reader 1: Within several minutes the 23 chromosomes in the nucleus of the egg cell and 23 within the nucleus of the sperm cell meld together to form one single cell with 46 chromosomes to serve as a control center for a new individual. These chromosomes have already been subjected to various environmental hazards. The cell divides over and over again forming a grape like mass of daughter cells as it journeys down the fallopian tube towards the uterus. This mass is a 32 celled Morula.

Reader 2: In the first week the Morula enters the uterus and differentiation begins with cells continually forming and taking on their own identity to form the various organs with unique capabilities and characteristics receiving commands from the genes as to what they are to become. Differentiation is a delicate process and its diversion or interruption can be dangerous.

Reader 3: Within the first week the Blastocyst finds a home in the lining of the womb by secreting chemicals which dissolve some of the mother's uterus tissue opening a pathway into which it can nestle. The mother's hormones help this process by giving the uterus a spongy, pliable, inviting consistency. The quality of the uterus has been formed by the nutrition and general health of the mother. Half of all pregnancies fail at this important stage.

Reader 4: During the second week the cells divide, redivide and differentiate. The food gathering cells burrow

Ditto 17

deeper into the uterine lining sending out rootlike structures called villi which will be part of the placenta. At this point all differentiation stages have started. All organ systems have formed individual identity. The life support system of villi, placenta and amnionic sac filled with fluid to protect and cushion the developing child have formed. The time of differentiation is one of vulnerability.

Reader 5: The Embryo now has an elongated shape with a large sphere attached known as a yolk sac which serves as the blood formation center until the fetus can make its own marrow in the 4th week. The villi are pressing vigorously into uterus every day to soak up nutrients from the womb. Those nutrients must be adequate and well balanced. The limbs form at this time in a very recognizable living form with millions of cells each doing their specialized function.

Reader 6: In the 6th week the Embryo now has a more human appearance. Some of the primitive organ systems are now functioning: the heart is vigorously pumping blood, the kidneys will soon filter and excrete, the thyroid and adrenals are taking shape, the central nervous system is well defined, there are primitive lungs and the stomach and intestines are formed. Interruptions at this time divert gland and organ formation. Tiny stumps of arms and legs now have tiny fingers and toes. The Embryo has increased in size 10,000 fold !! This is a time of delicate balance, vulnerability and potential failure. The growing Embryo needs constant support, nutrients and protection.

Reader 7: The sensory equipment is rapidly developing in the 8th week. The eyes, nose, ears, muscle, bones and cartilage are forming. It is a crucial time for the sensory organs by any disruptive element. The fetus has definitely taken on the appearance of a human being.

ALL FUNDAMENTAL FRAMEWORK IS COMPLETE. ALL THE BASIC ORGANS NEEDED TO SUSTAIN THE INDIVIDUAL FOR LIFE HAVE BEEN FORMED. IT IS AT THIS POINT THAT A GIRL OR WOMAN MAY BE BEGINNING TO KNOW AND BELIEVE THAT SHE IS PREGNANT!

II. The Teenager

Ditto 18

Group 2

Reader 1: At three months new growth and refinement now take place with heightened physical activity. Bone marrow now replaces the yolk sac as a source of red blood cells. Eyelids are forming although they remain sealed until the sixth month. The oral cavity parts fuse and the unborn child swallows. The unborn child is laying down muscle and bone tissue, moving and exercising.

Reader 2: In the fourth month the unborn child continues to grow in size, strength and length. Blood now pumps through the umbilical vein. Now the relationship between the baby and the outside world is more definite. More muscle structure is layed down. Hair and fingernails are formed. The heart can be heard, a kick felt.

Reader 3: During the 5th month the unborn child is nearly formed except for size. More weight is added. The trunk and legs elongate. More hair is added. The unborn child becomes aware of his environment. The eyes open and the child sees light. The unborn child exercises, sucks the thumb and hears outside sounds.

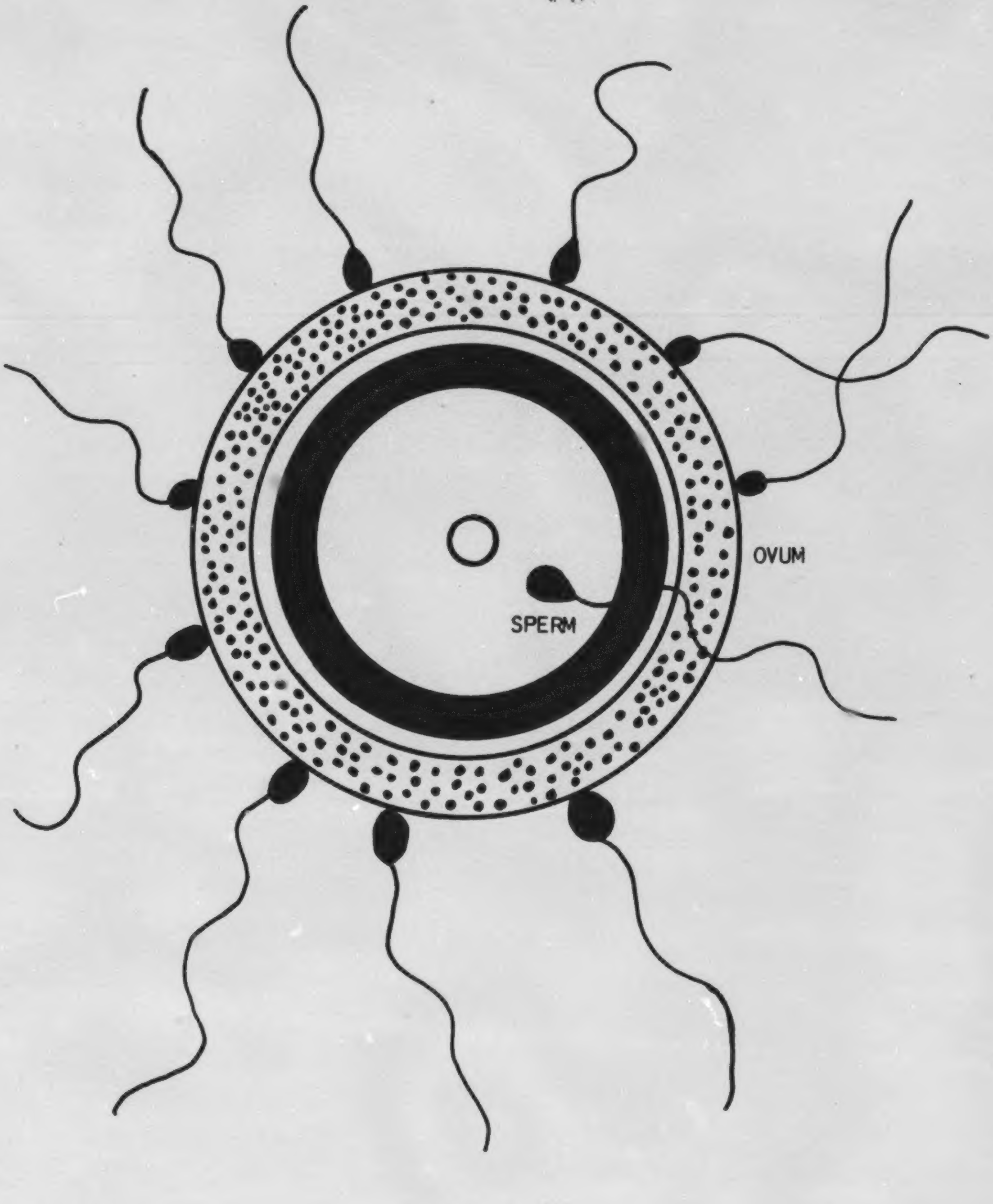
Group 3

Reader 1: In the 8th and 9th months the unborn child accumulates fat for insulation. The lungs and brain become more defined. The child must remain in the womb for these refinements and weight gain for the optimum transition to the outside world.

II. The Teenager

Transparency I

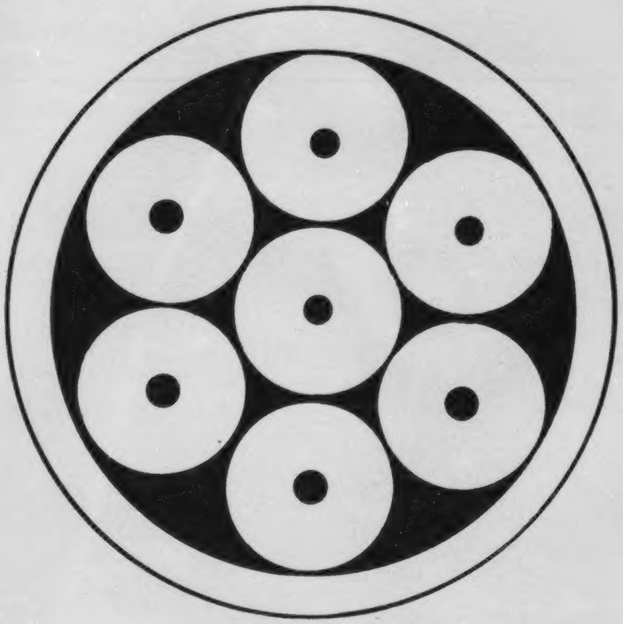
CONCEPTION



II. The Teenager

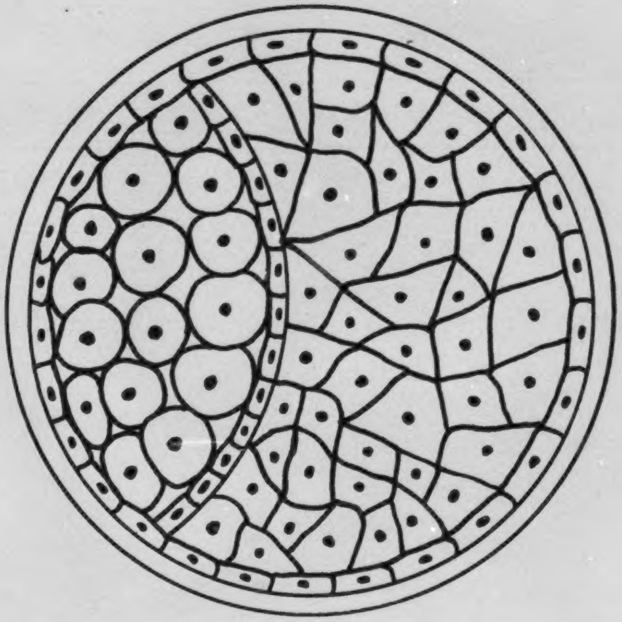
Transparency 2

THE MORULA (2 days)



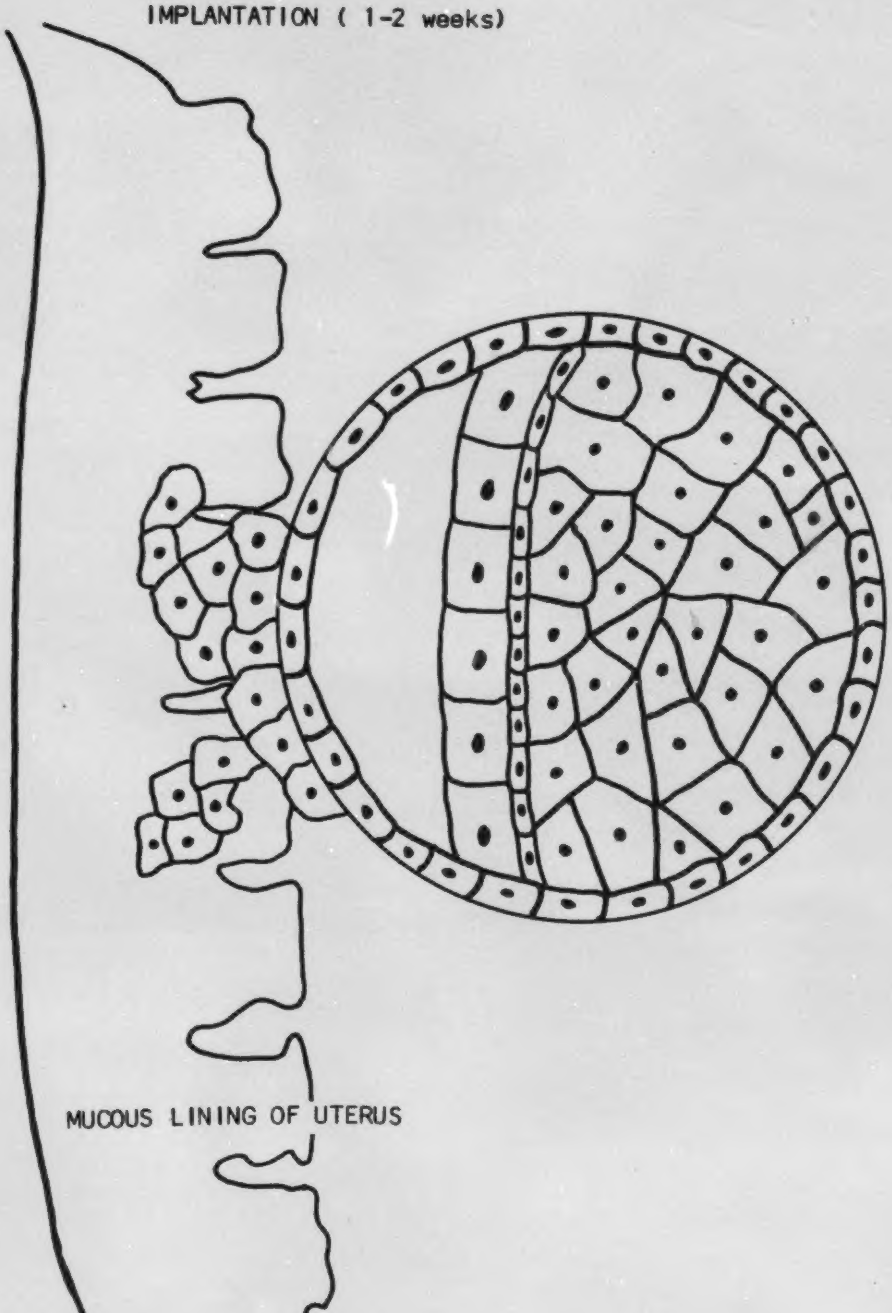
Transparency 3

THE BLASTOCYST (1 week)



Transparency 4

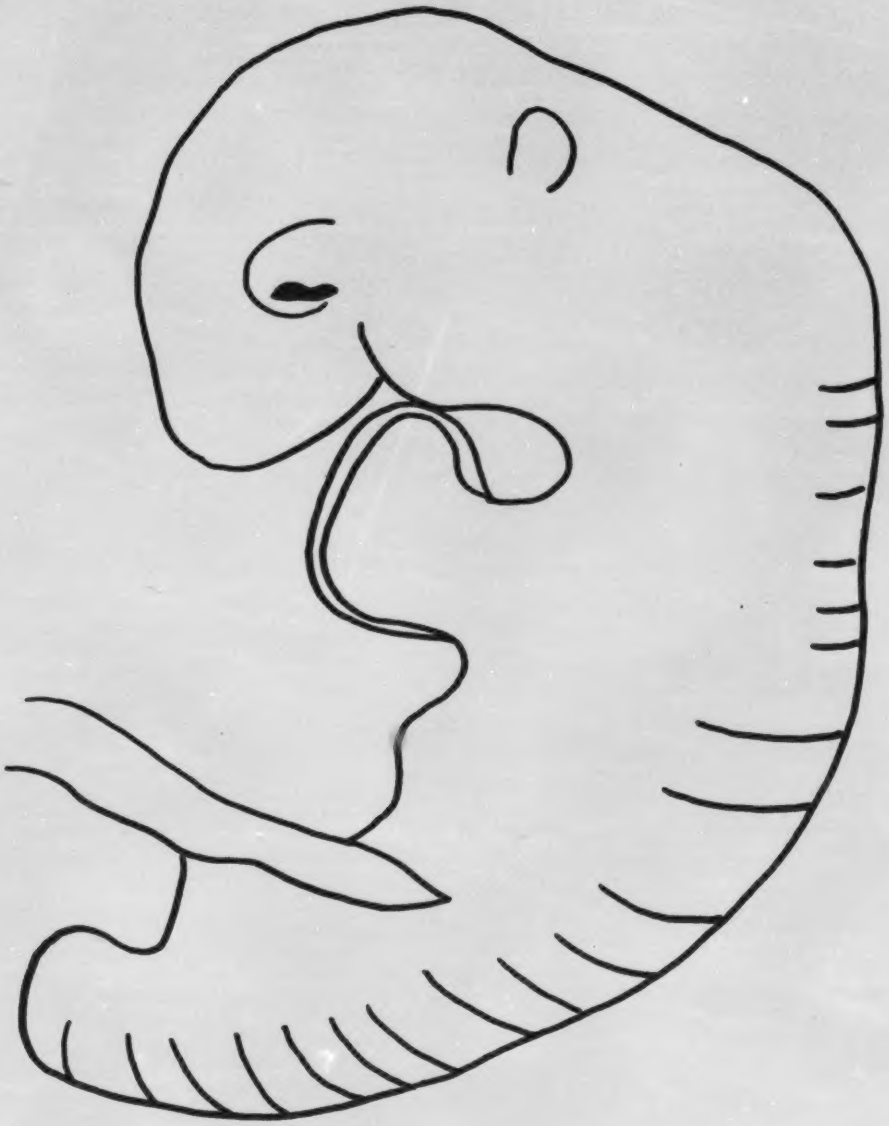
IMPLANTATION (1-2 weeks)


MUCOUS LINING OF UTERUS

II. The Teenager

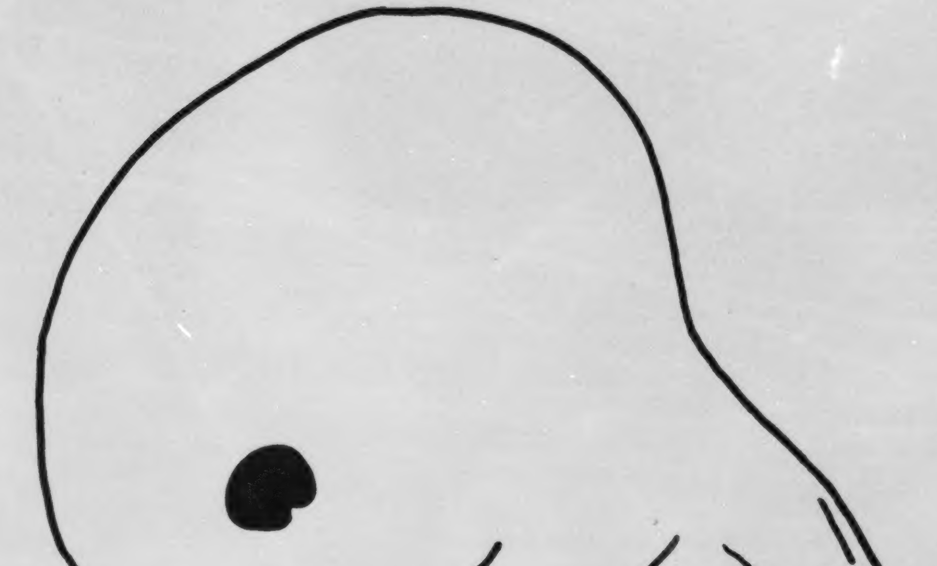
Transparency 5

4 weeks



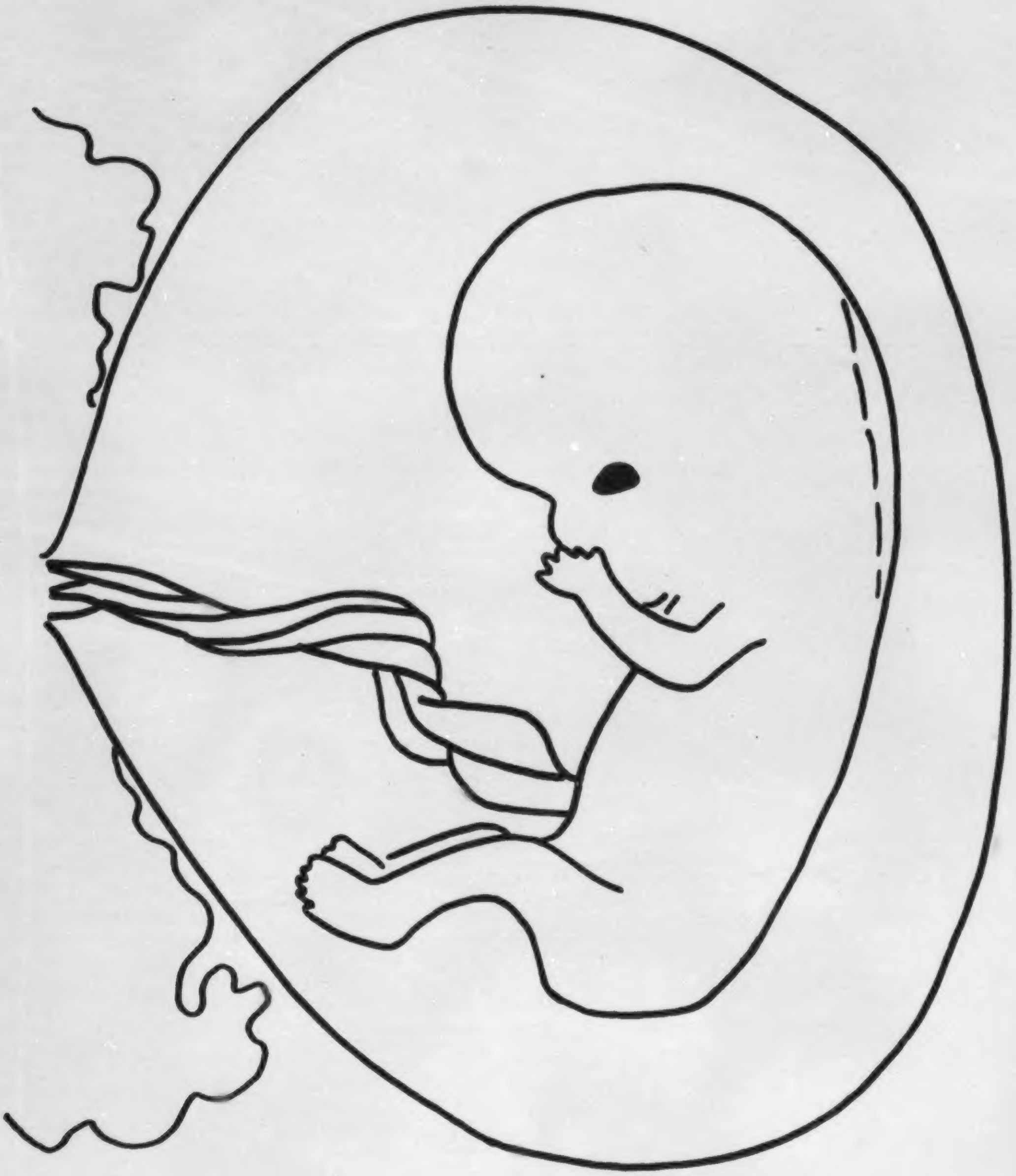
Transparency 6

5 weeks



Transparency 7 [illegible]

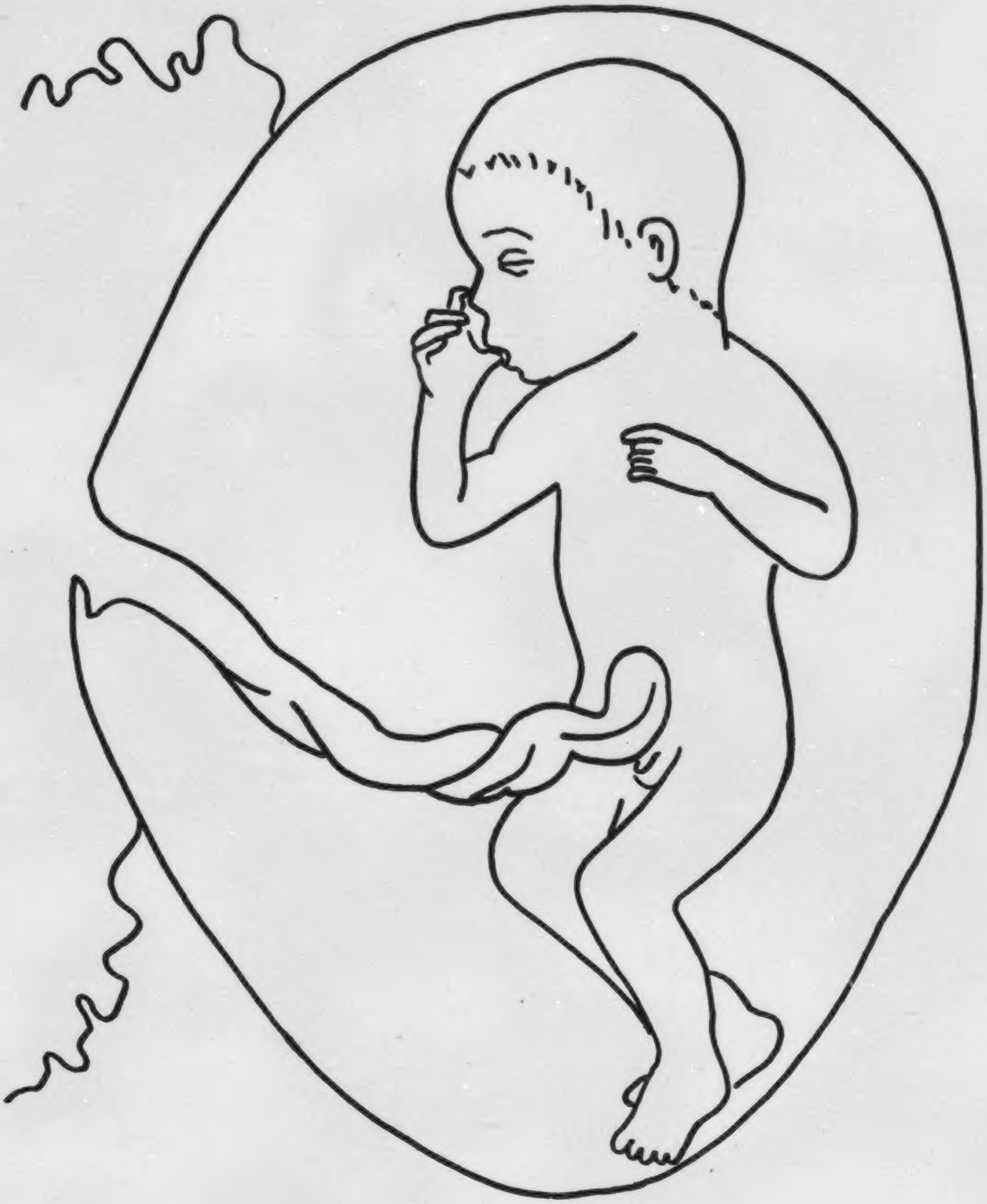
8 weeks



II. The Teenager

Transparency 8

5 1/2 months

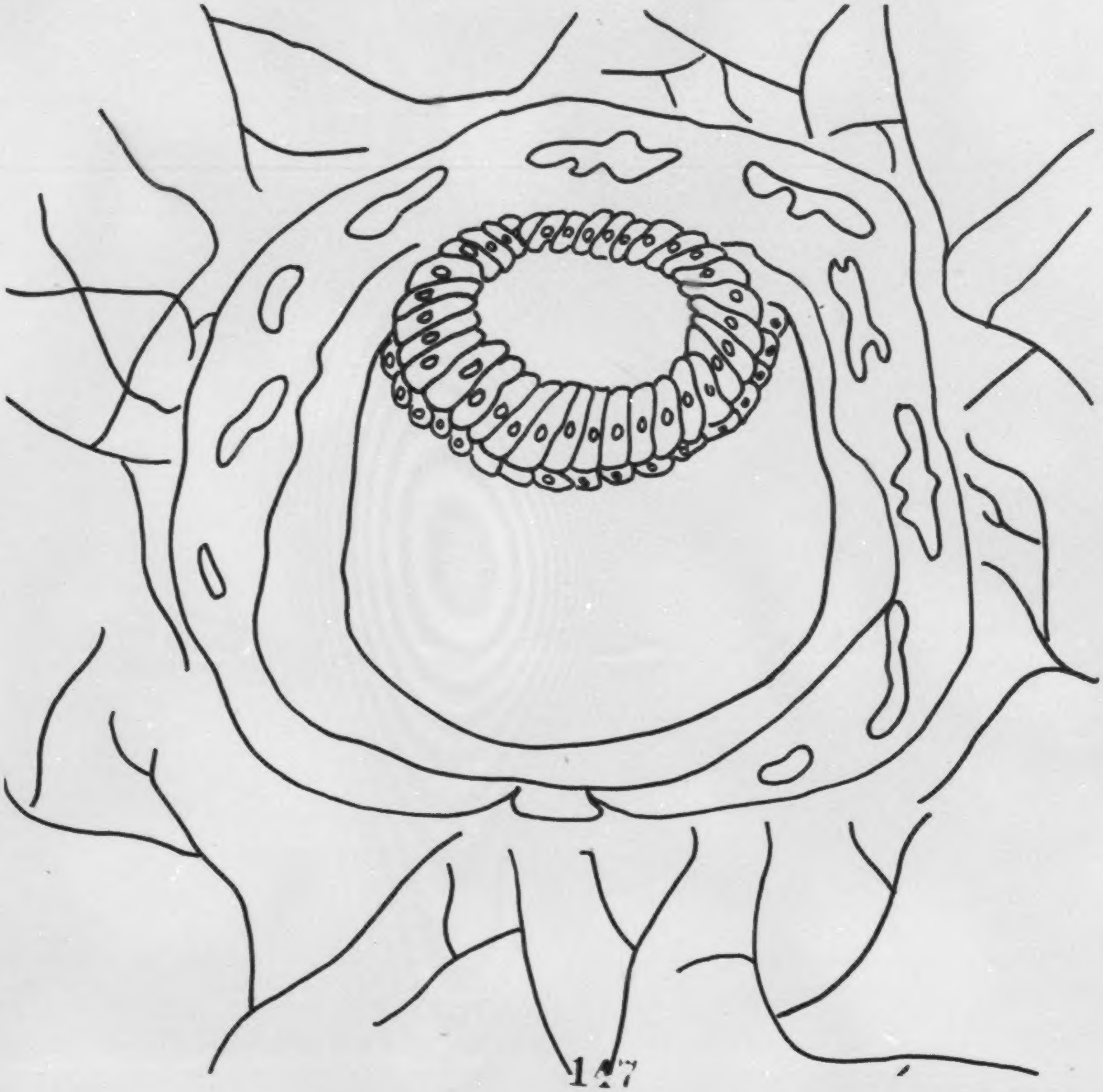


Transparency 9 : BIRTH!

II. The Teenager

Transparency 10

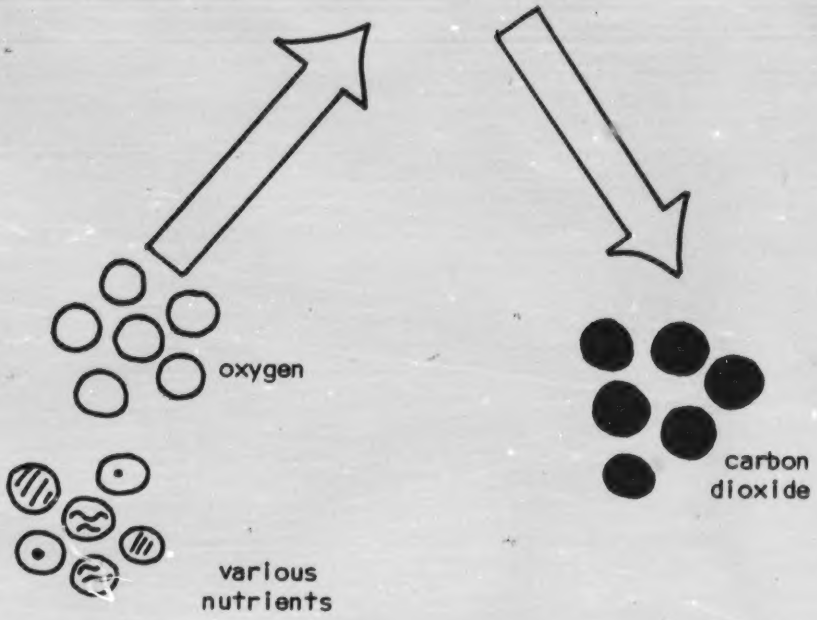
Embryo Cells Surrounded by Mother's Capillaries



Transparency II

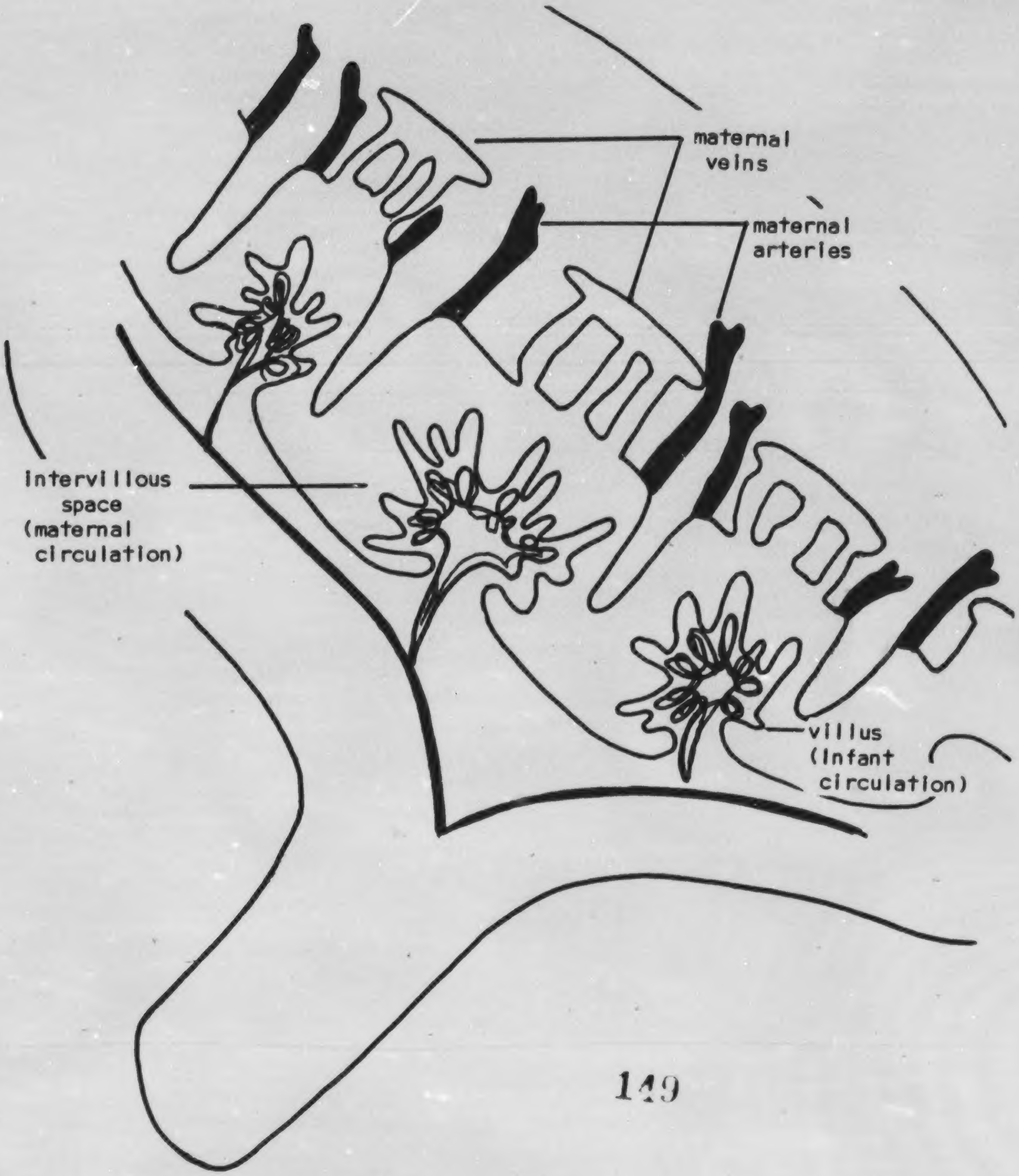
Nutrients and Oxygen enter the cell.

Carbon dioxide leaves the cell.


oxygen
various nutrients
carbon dioxide

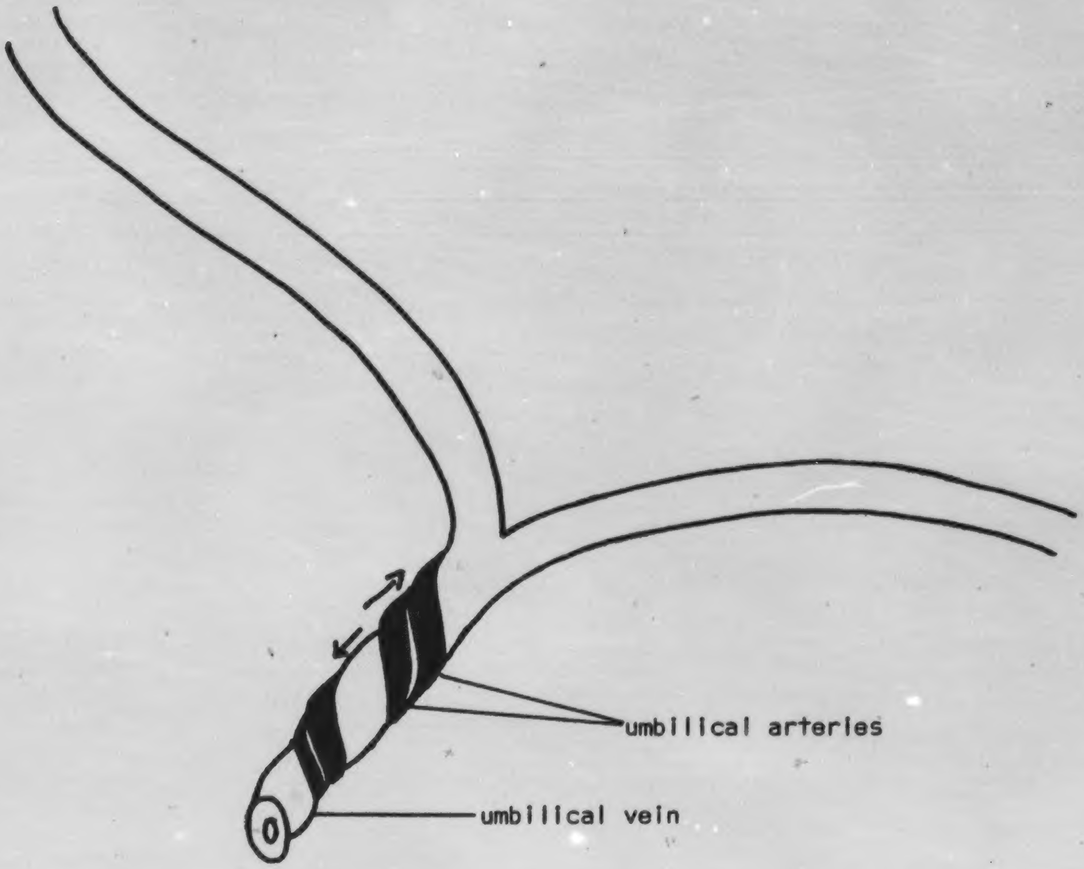
Transparency 12

The Placenta


maternal veins
maternal arteries
intervillous space (maternal circulation)
villus (infant circulation)

Transparency 13

The Umbilical Cord

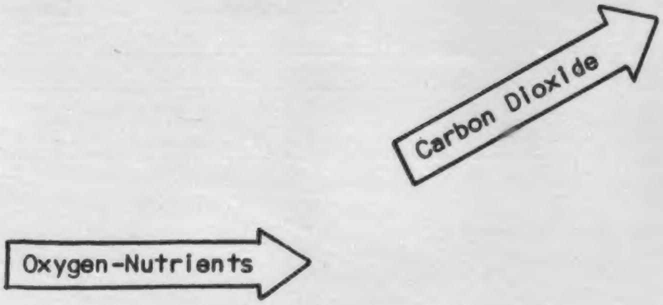

umbilical arteries
umbilical vein

Transparency 14

The Flow of Nutrients

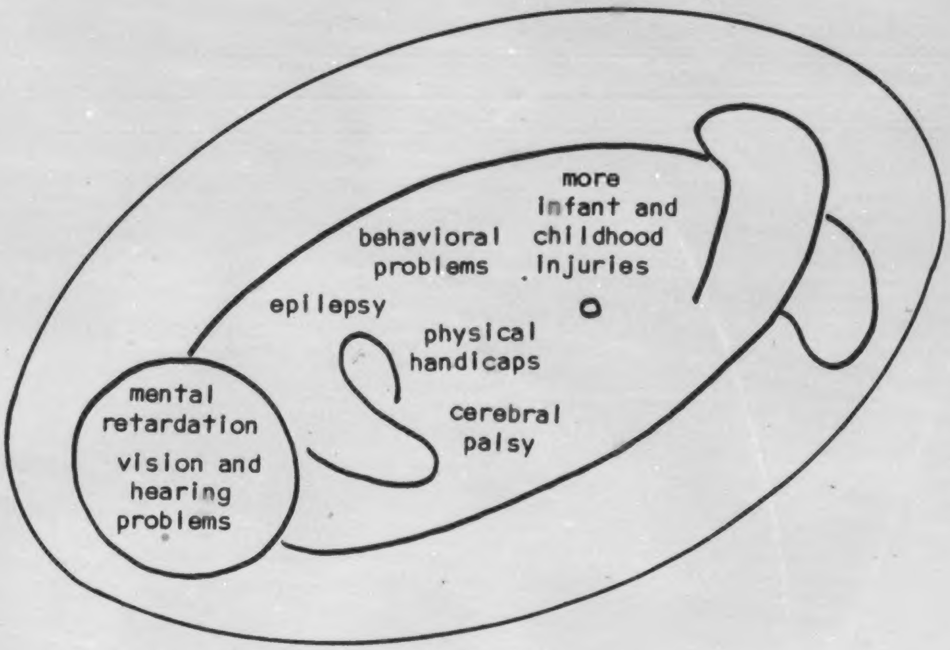
Oxygen

Carbon Dioxide


Carbon Dioxide
Oxygen-Nutrients

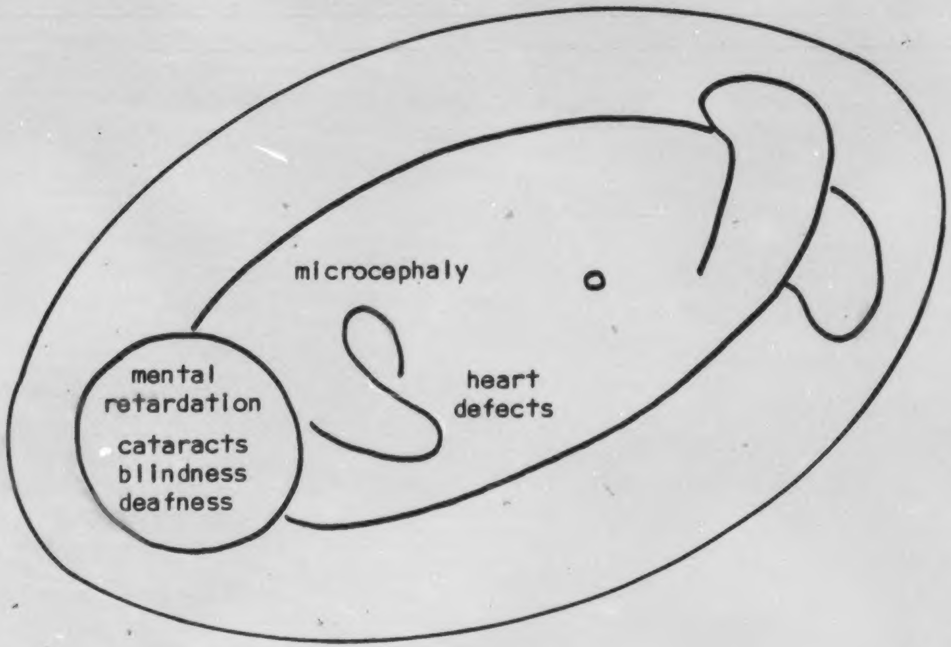
Ditto 19

The Premature Infant


more infant and childhood injuries
behavioral problems
epilepsy
physical handicaps
cerebral palsy
mental retardation
vision and hearing problems

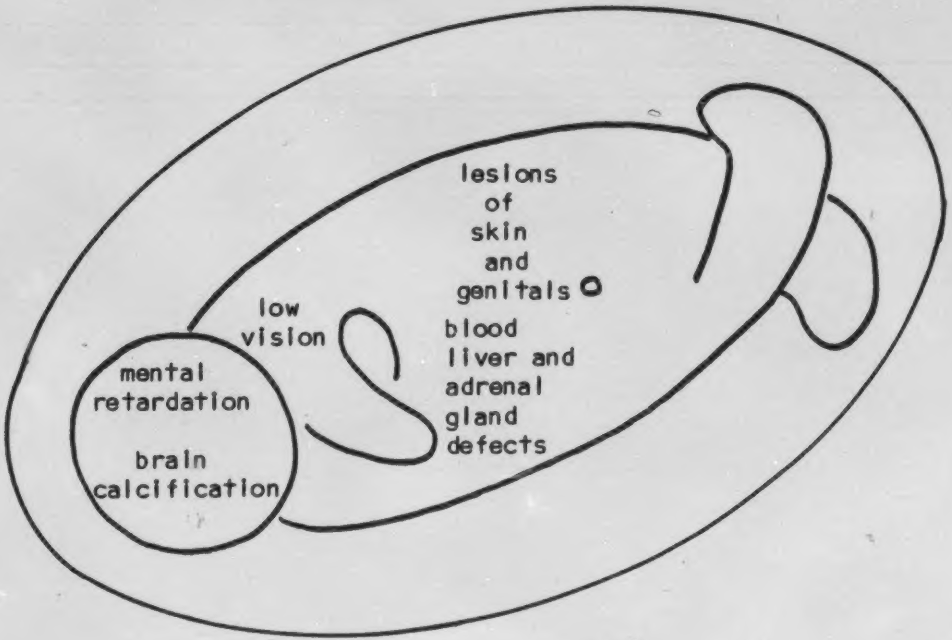
Ditto 20

The Rubella Child


microcephaly
mental retardation
cataracts
blindness
deafness
heart defects

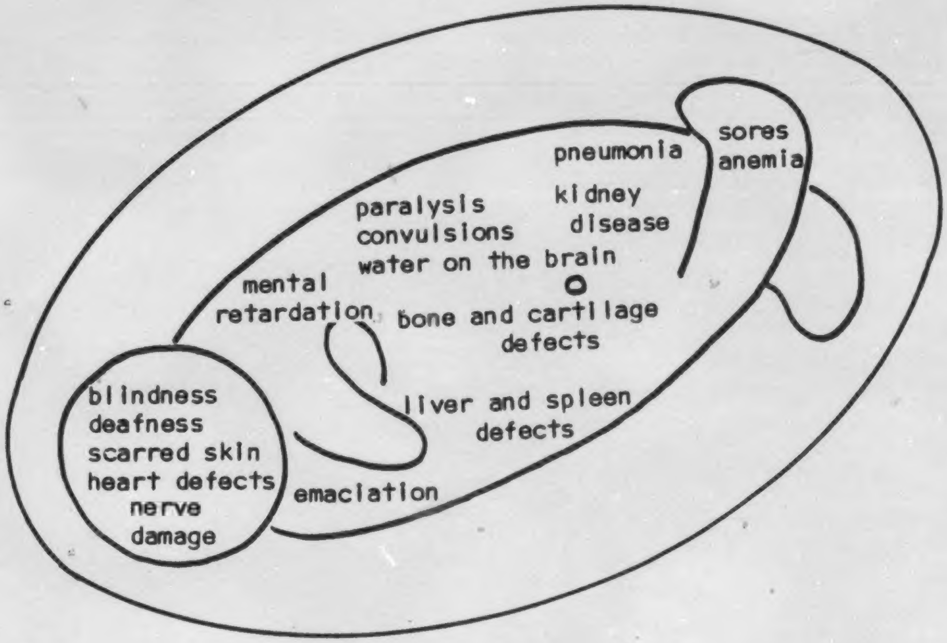
Ditto 21

The Herpes Infant


lesions
of
skin
and
genitals
low
vision
blood
liver and
adrenal
gland
defects
mental
retardation
brain
calcification

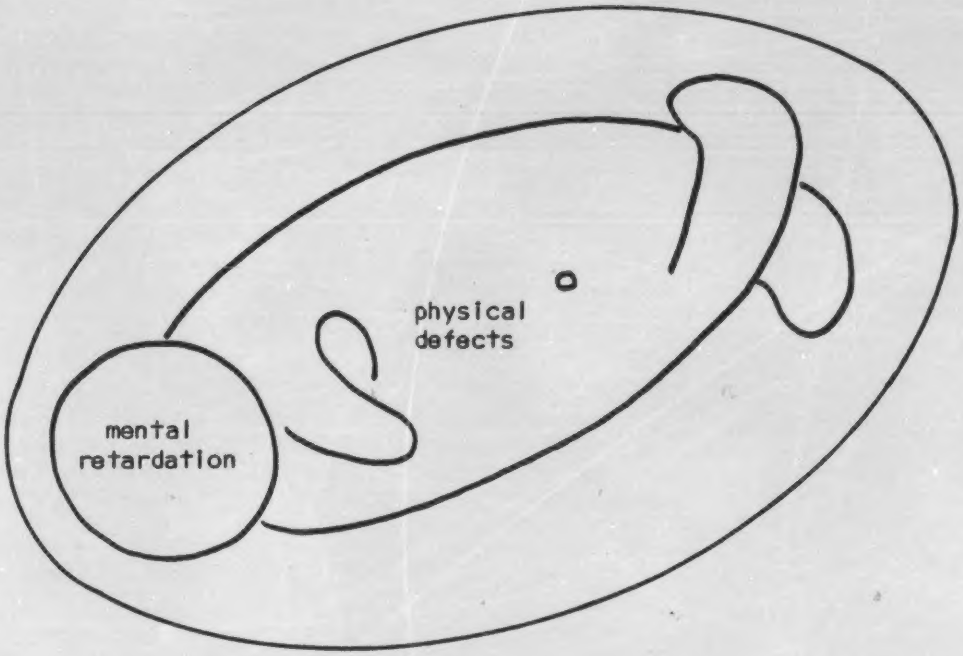
Ditto 22

The Syphilitic Infant


sores
anemia
pneumonia
kidney disease
paralysis
convulsions
water on the brain
mental retardation
bone and cartilage defects
liver and spleen defects
emaciation
blindness
deafness
scarred skin
heart defects
nerve damage

Ditto 23

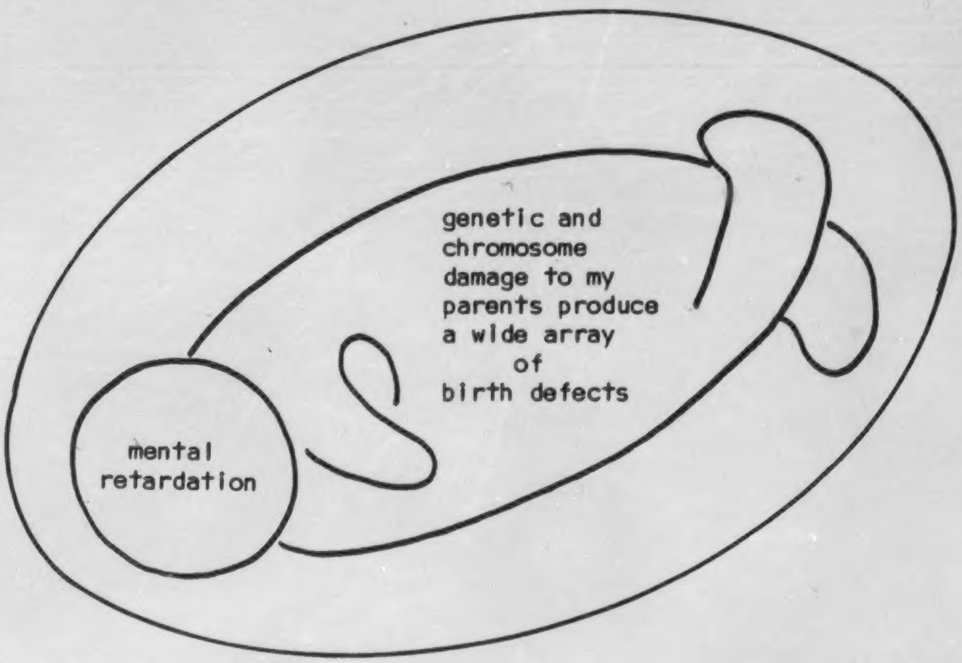
The Drugged Infant


physical
defects
mental
retardation

II. The Teenager

Ditto 24

The Child of Irradiated Parents


genetic and chromosome damage to my parents produce a wide array of birth defects
mental retardation

II. The Teenager

Ditto 25

I will:

____ Limit the childbearing years from 20 years of age to 35 years of age.

____ Be sexually responsible.

____ Avoid venereal disease.

____ Be tested for venereal disease if infection is a possibility and obtain treatment if infected.

____ Be immunized against Rubella.

____ Eat foods that provide a diet adequate in calories and nutrients.

____ Be in control of your own life in relation to drugs, self medication, alcohol and smoking.

____ Avoid excessive or unnecessary x-rays for medical and dental diagnosis and treatment.

____ Request proper shielding of the sex organs when being x-rayed. (Particularly males!!)

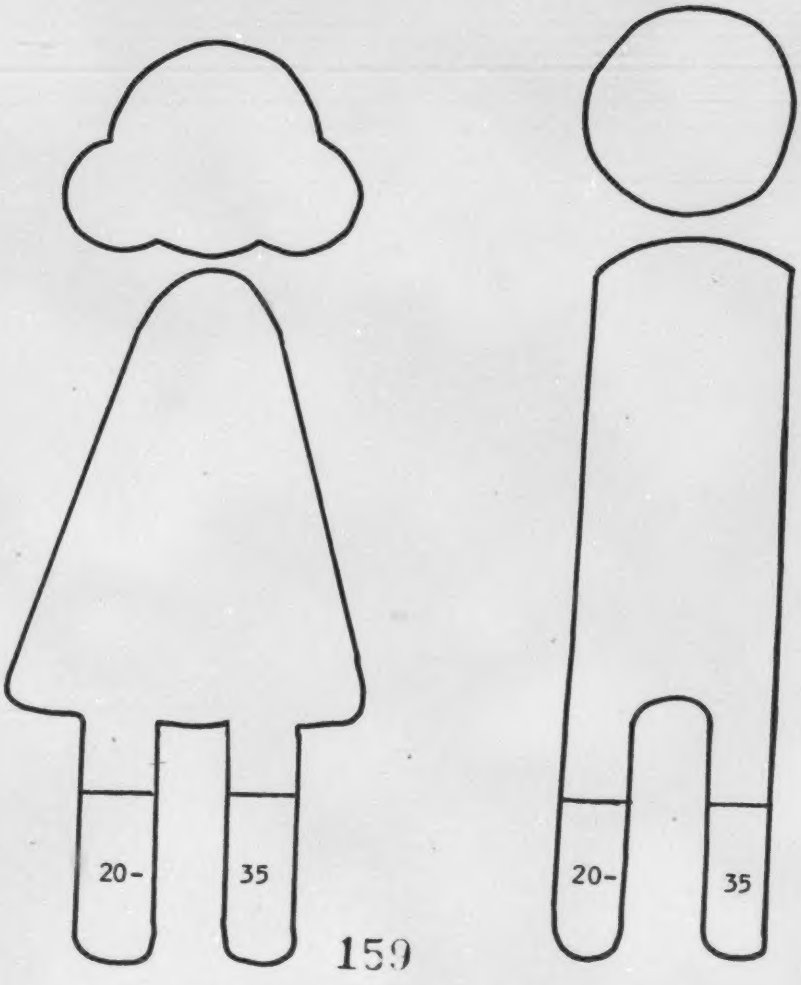
____ (Girls only!) Request a pregnancy test before being x-rayed if there is any possibility that you are pregnant.

____ (Girls only!) Obtain regular cervical examinations by a gynecologist if involved in frequent sexual intercourse in the young teenage years.

____ Follow all recommendations for the man and woman, man and woman planning for a child, the pregnant woman and the father, the woman in labor and birth and the father, the mother and father of the newborn if you find yourself either a mother or father in the teen years.

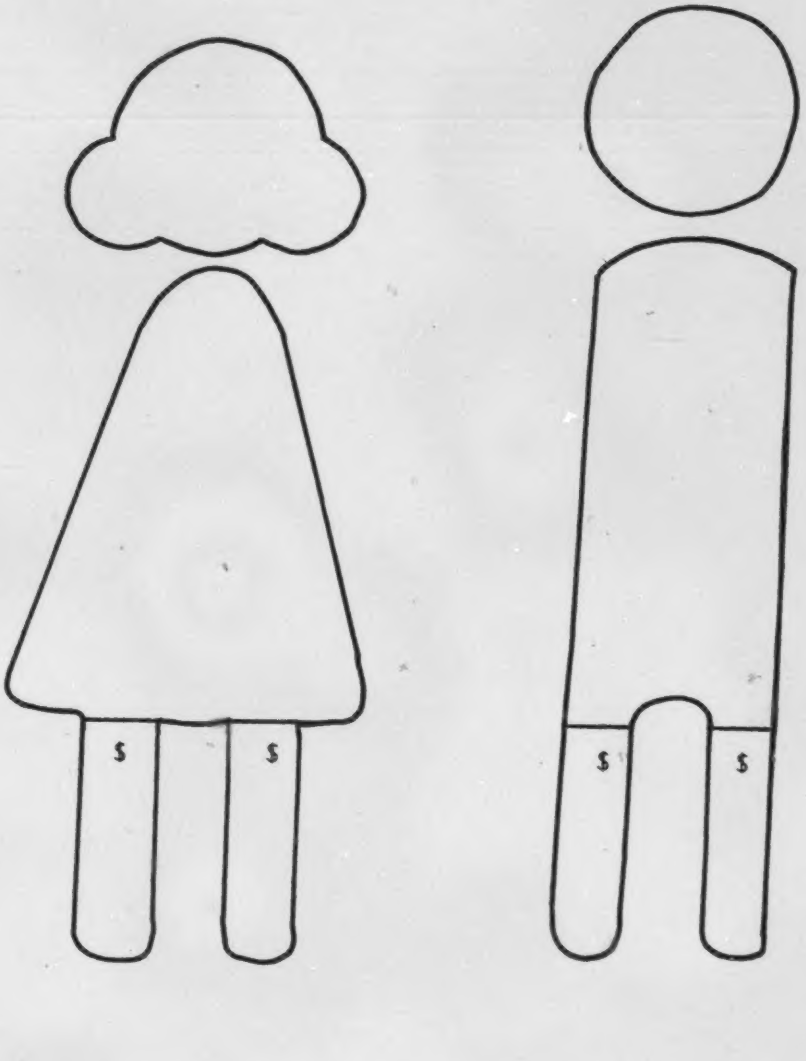
Transparency 15

The Childbearing Years #1



Transparency 16

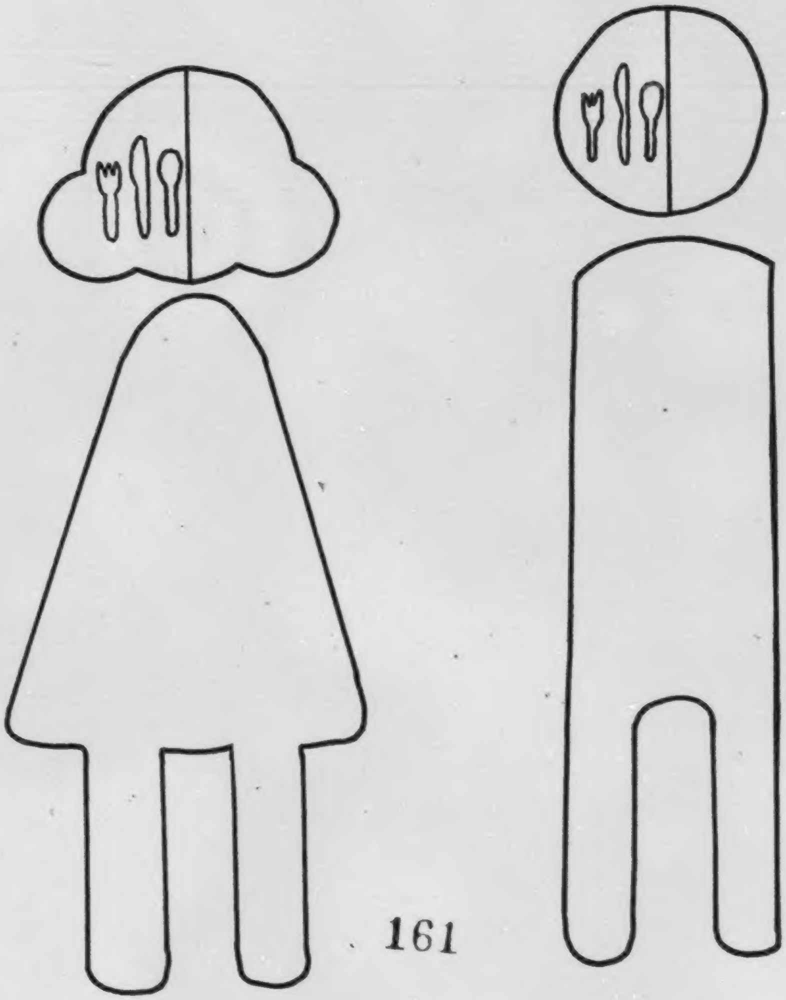
Financially Supportive #2



II. The Teenager

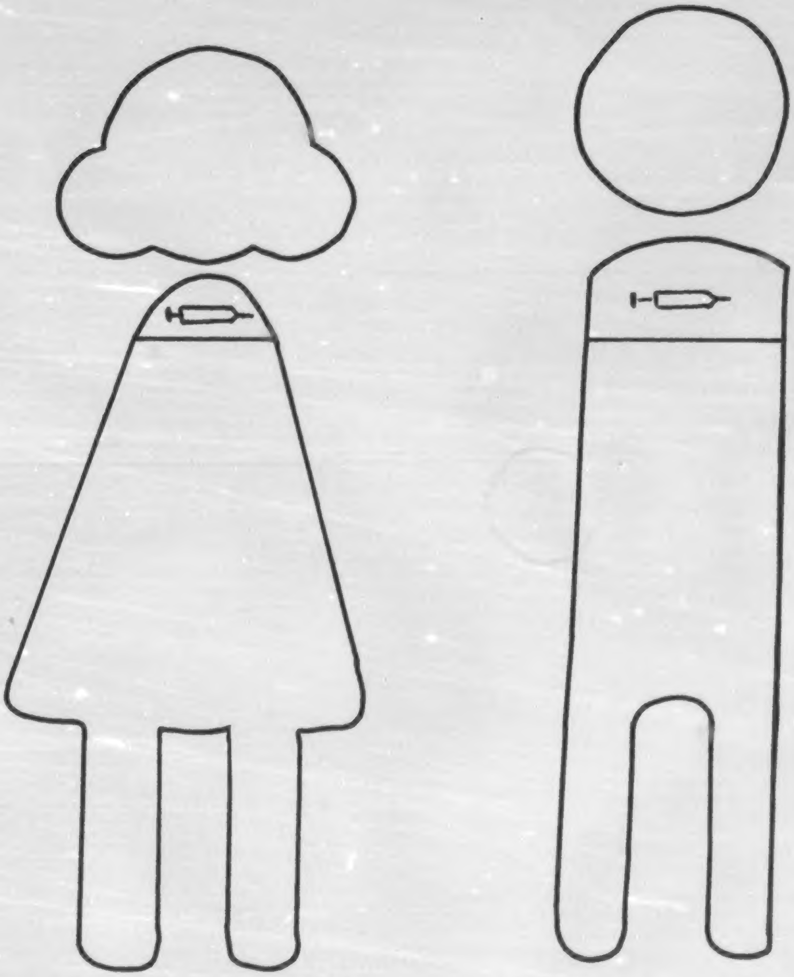
Transparency 17

Good Nutrition #3



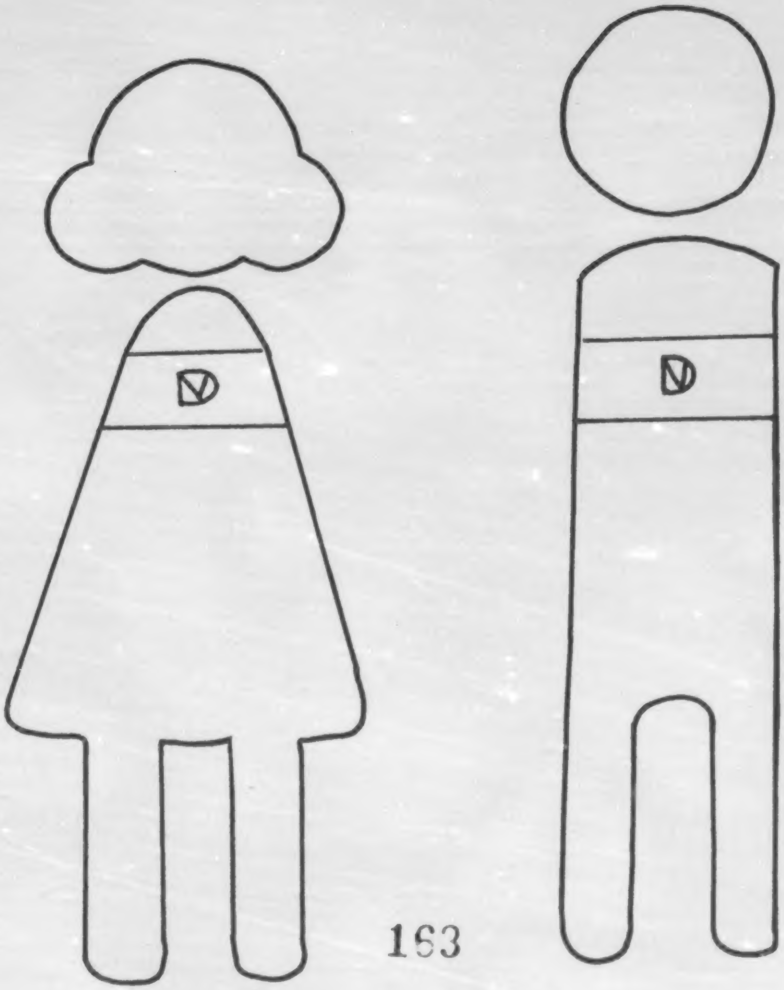
Transparency 18

Immunization #4



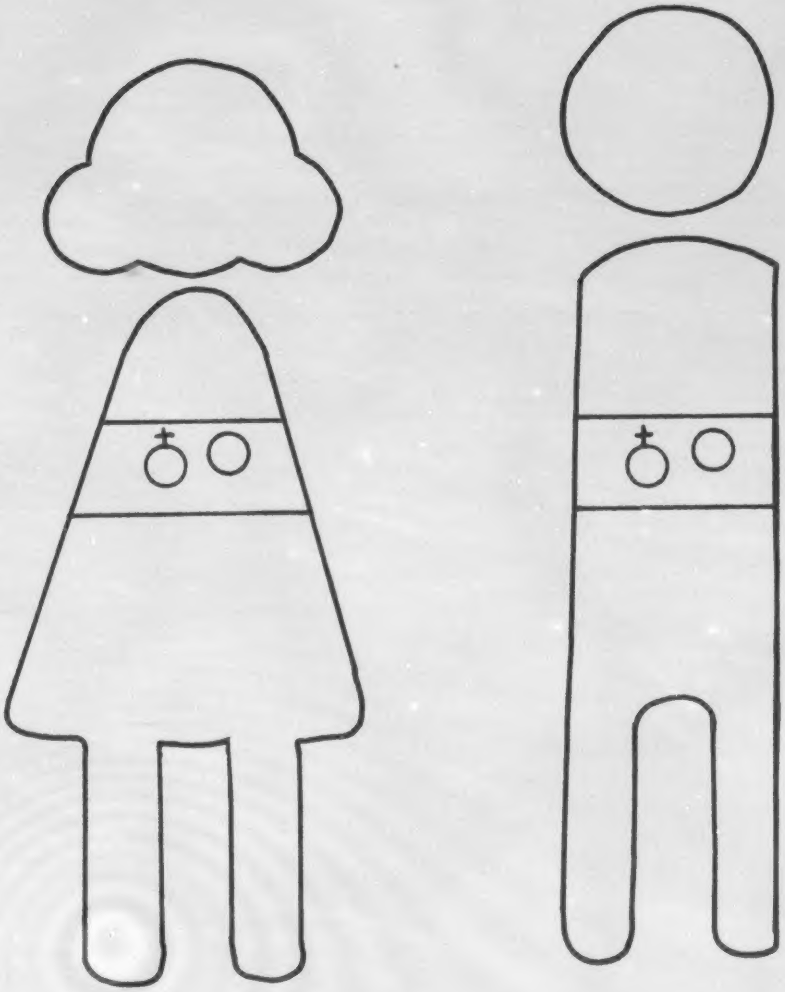
Transparency 19

Venereal Disease #5



Transparency 20

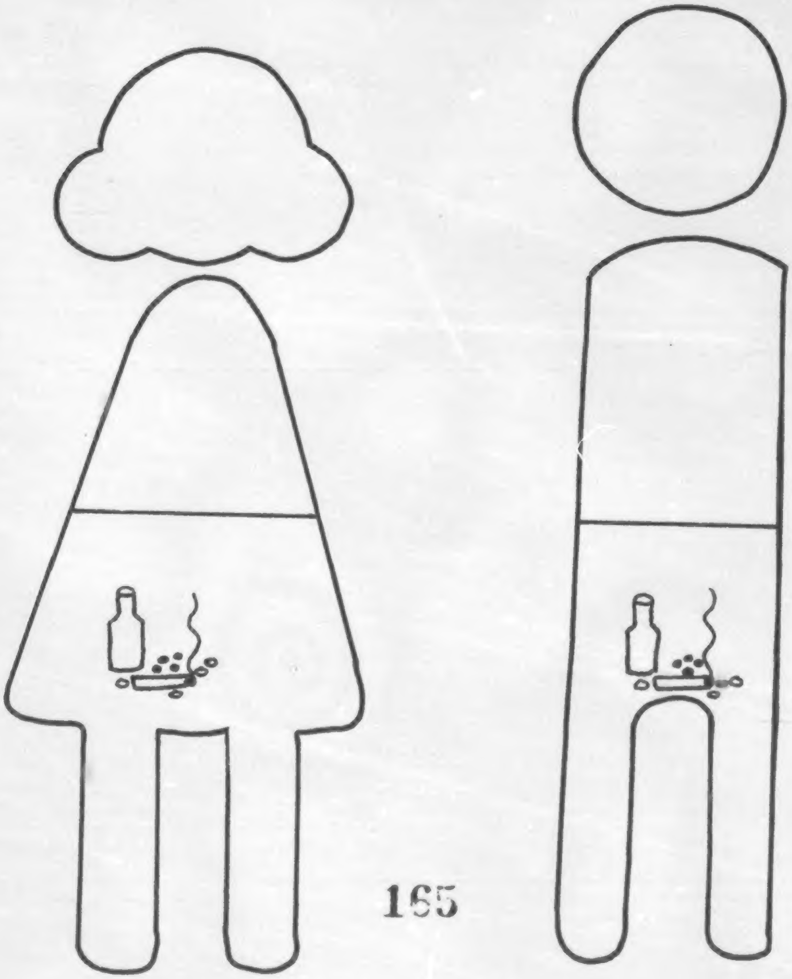
Sexual Responsibility #6



II. The Teenager

Transparency 21

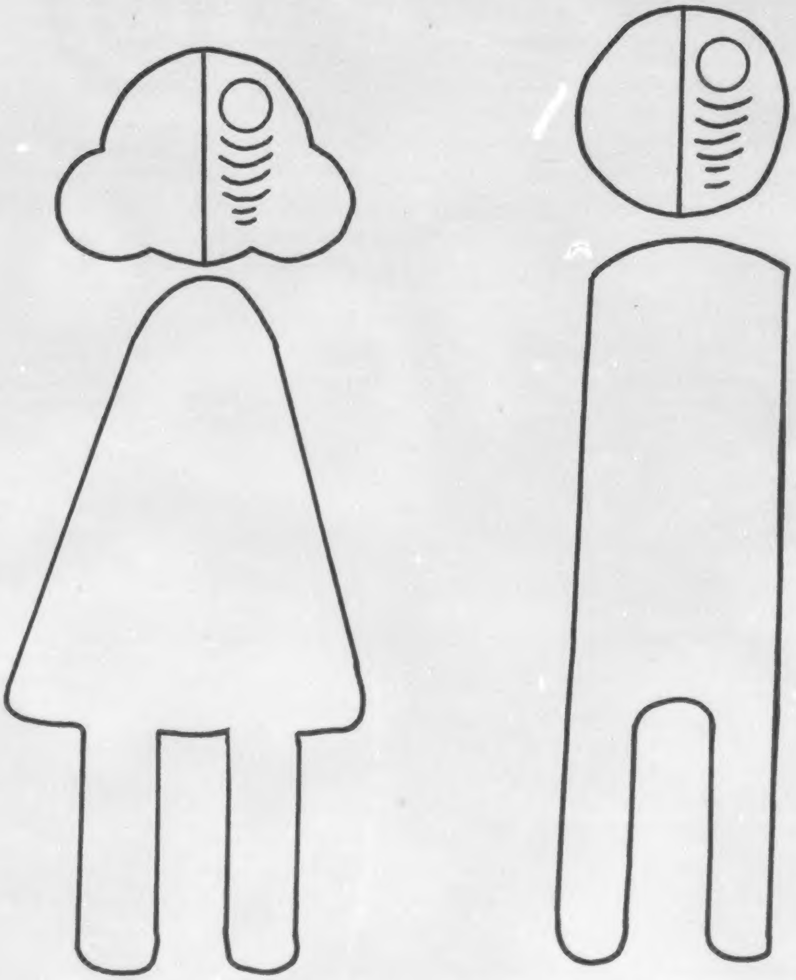
Drug Intake Control #7



II. The Teenager

Transparency 22

Radiation #8



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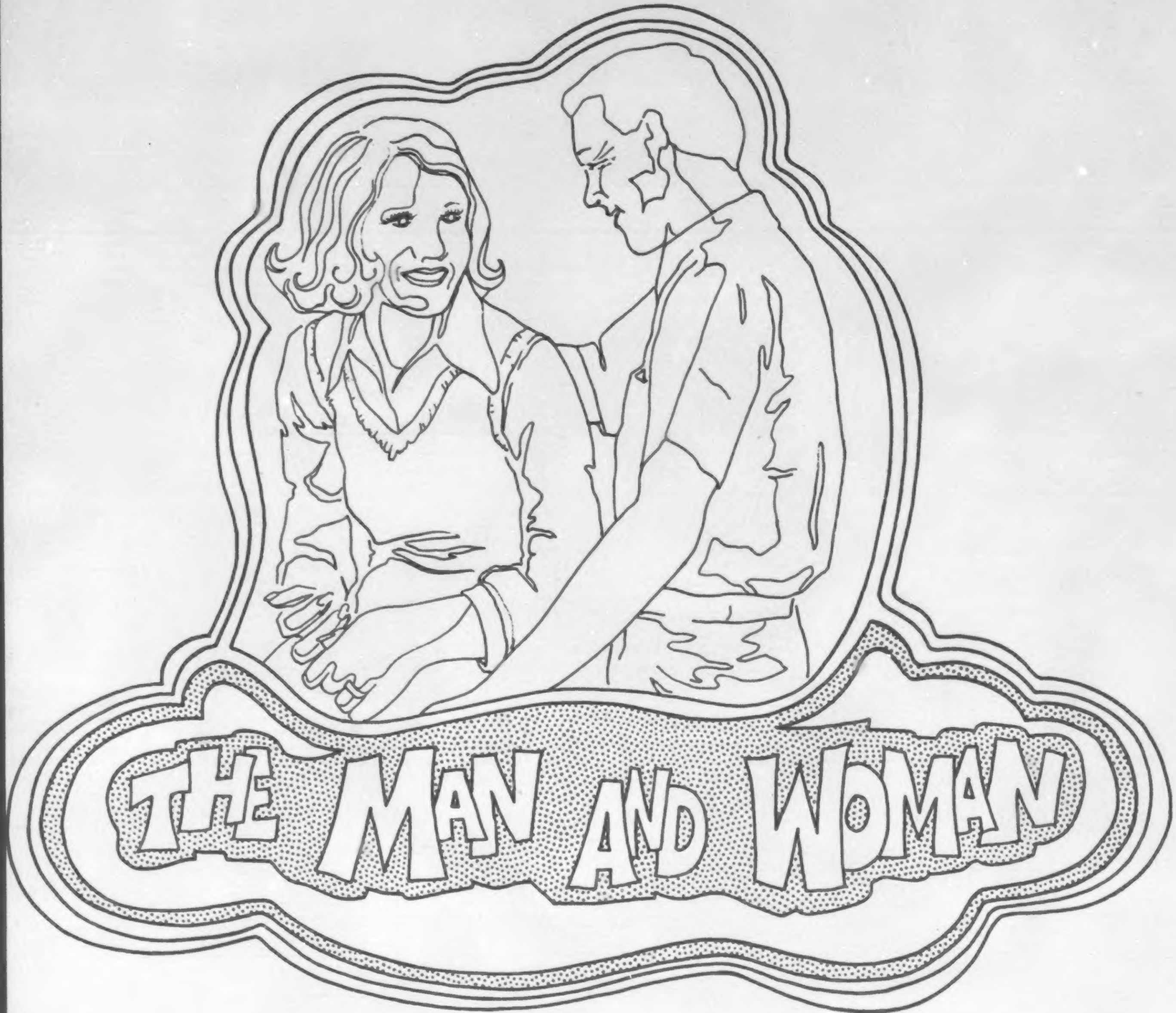

THE MAN AND WOMAN

II. The Man and Woman ⇨ Towards the Prevention of Mental Retardation in the Next Generation

⊳ Objectives

General

a. The student will understand how the genes and chromosomes of a mother and father effect the quality of life of their child or children.
b. The student will know that there is a potential "genetic risk" in the conception of every individual.
c. The student will be able to identify what some of the genetic risks are in having children.
d. The student will know what responsibilities he or she must take to lessen or prevent the possibility that he or she may produce a mentally retarded child.

Specific

Cognitive

1. The student will be able to give a definition of chromosome, gene, autosome, sex chromosome, genetic defect and karyotype.
2. The student will be able to state the percentage incidence of genetics as a causation factor in mental retardation.
3. The student will be able to list the kinds of potential parents that are at high risk in having genetically defective children.
4. The student will be able to list five broad categories of genetic defect causation factors.
5. The student will be able to give a simple explanation of the mechanism causing dominant, recessive, x-linked, chromosomal and multifactoral defects.
6. The student will be able to define genetic counseling.
7. The student will be able to explain what procedures a man and woman go thru when they receive genetic counseling.
8. The student will be able to state what six broad categories of information should be included in a Family Medical Record.

Affective:

1. The student will feel that an individual's genetic make-up plays an important part in the quality of life of their potential children.
2. The student will realize that everyone carries a certain amount of genetically defective material.
3. The student will feel that it is possible that they may contribute defective genes to their future children.
4. The student will feel that it is possible to receive professional help in determining whether or not they are potential parents at high risk in having a defective child.
5. The student will feel that given an understanding of their own genetic make-up and their own possible genetic risks that they will have more control over the outcome of the quality of life of their potential child or children.
6. The student will feel that given genetic counseling they would be able to make a better, more informed decision in deciding whether or not to have children.
7. The student will be motivated to:
   - Keep their own medical record.
   - Determine if they are a high risk potential parent.
   - Receive genetic counseling if they are potentially a high risk parent.

Background Material For The Teacher

THE GAME OF CHANCE

Most of what we call "modern genetics" isn't much more than 70 years old . . . a young and rapidly growing science. The specific linking of mental retardation to genetics is younger yet. Not until 1956 did two researchers, Tjio and Levan, publish an easy way for looking at the genetic material of human beings. Then in 1959, Lejeune described the first birth defect known to be caused by a change in chromosome structure or number. Since then, that ball of knowledge has been picking up speed and size with almost alarming speed. Since Lejeune's discovery, more and more causes of mental retardation are being identified as genetic. It is rare that a "family tree" is free from genetic disorders no matter how small or insignificant that disorder may be. A simple fact, but one that is probably hard for each of us to accept, is that we all walk around with from five to eight defective genes that can interfere with growth, life and normality in our offspring. However, fear of genetics and fear of the genetic monkey on our back may be more from ignorance than from reality. Let's look at some facts that can make us justifiably apprehensive.

... There are over 2,000 known serious defects that are genetically inherited.

... There are in addition to those 2,000, many more defects which are caused by an interaction of genes and environment.

... Estimates of genetic factors causing mental retardation range from 5% to 51%.

... Twenty percent of all the more severe types of mental retardation are caused by genetic defects.

... Over 10% of individuals residing in state institutions for the mentally retarded are of genetic causation.

... It is estimated that 1% of all children have too little or too much genetic material.

... Over 100,000 genetically defective infants are born each year in the United States.

... About one in every 50 conceptions has a chromosome abnormality.

... Of these one in 50, 40-50% abort spontaneously.

... Of all spontaneous abortions or miscarriages, 23% have some genetic abnormality.

... Twenty-five percent of all infant deaths are from inherited defects.

... Of patients sick enough to require hospitalization in children's facilities, about 20% have genetic related diseases.

... In terms of cost to society, genetic mental retardation causation factors tend to have the most impact on society for the retarded caused by genetic factors tend to be the most disabled, most severely retarded and have the most congenital defects that need expensive medical care.

... Each year with the birth of hundreds of thousands of genetically defective offspring, a future commitment of care by society is in excess of two billion dollars in terms of medical, custodial and special training costs.

... The untold guilt, frustration, stress and grief to parents of genetically defective infants is beyond imagination as is the "hurt", frustration and grief of the individual who must live within the retarded mind and body for a lifetime.

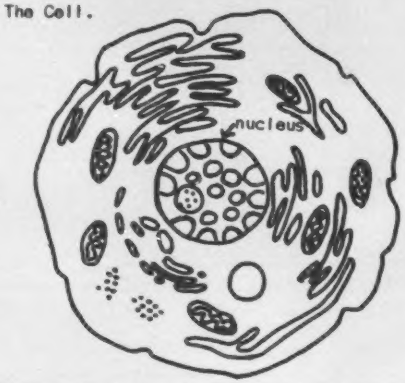
The facts underline that genetic causes of mental retardation are real, severe and extensive. Genetic errors during the reproduction of cells, fertilization and multiplication of cells can result in the passing on of defective genes from many generations past or abnormal number, structure and/or arrangement of new genetic material to be repeated over and over again as the millions of cells are formed that make up the new embryo. Let's start at "the beginning" and look at some fundamentals of genetics.

THE GAMBLE; NORMAL DEVELOPMENT

In the last 20 years a much clearer understanding has emerged of the diverse ways in which genetic material can effect growth and development.

The cell is the basic unit of life for all new processes occur within the cell. Each of hundreds of different chemical processes taking place in cells are directed by a specific enzyme which is produced according to specifications of one pair of the thousands of genes distributed in a balanced way among pairs of chromosomes in the cell.

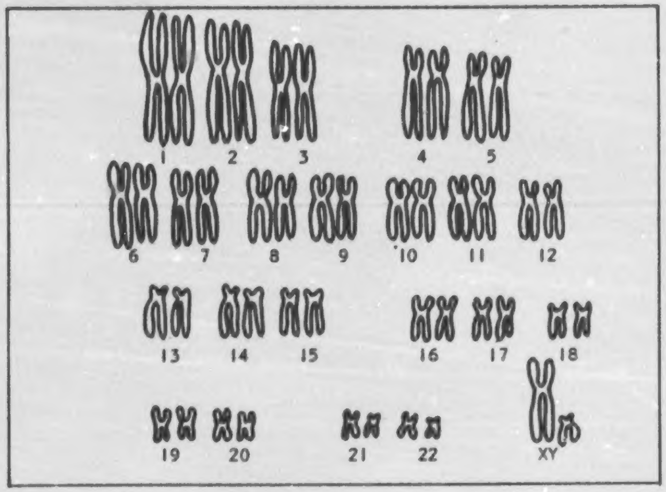
Figure 19. The Cell.



1. Chromosomes are minute, thread-like structures located inside the nucleus of every living cell that carry hereditary traits.
2. All cells in the human body except the ova and sperm cells have 46 chromosomes, 44 autosomes and 2 sex chromosomes.
3. Chromosomes are composed of several tens of thousands of genes.
4. Genes are the smallest particle of hereditary information put together in a specific sequence of hundreds of sections of chemical segments to form the chromosome and carry the blueprints for all the detailed structure of our bodies.
5. Genes are made up of deoxyribonucleic acid or DNA which consists of primarily four chemicals put together to construct proteins in the cell called enzymes, which direct all of the metabolic life of the cell.

Scientists have photographed stained cells, cultured from a blood, bone or tissue sample, and then arranged the cells in a karyotype. The chromosomes are paired according to size and then ordered in a series by length, largest to smallest, from 1 to 22. The sex chromosomes are the last pair in the karyotype.

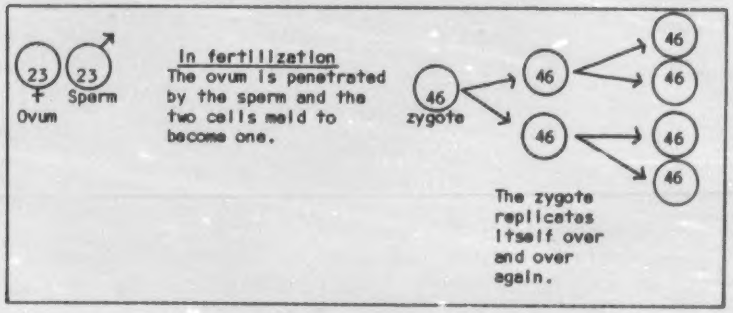
Figure 20. The Normal Karyotype


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
XY

1. All normal cells except the ova and sperm have 46 chromosomes, 44 autosomes (number 1-22) and 2 sex chromosomes (XY).
2. The sex chromosomes determine the sex of an individual. All normal males have one Y chromosome and one X chromosome and normal females have two X chromosomes. All other chromosomes in the cell are known as autosomes.
3. The genes make up the chromosomes. A gene for a particular trait on one chromosome has a gene for that same particular trait on its paired chromosome. So genes as well as chromosomes that they reside in come in pairs.
4. Each chromosome carries thousands of genes in specific order and matched by thousands of genes in specific order on the paired chromosome.

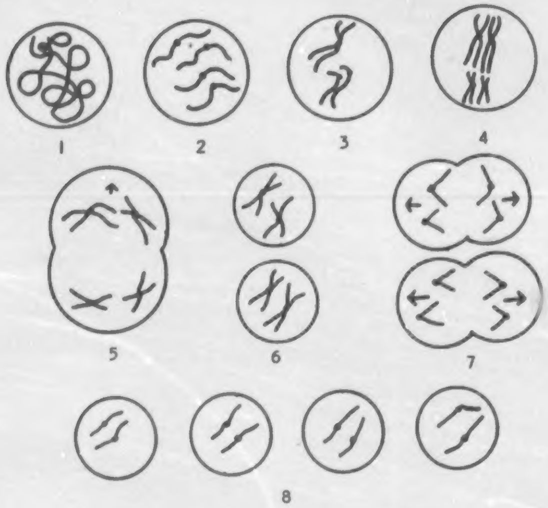
As the sperm with its 23 chromosomes (or half of the chromosomes pictured in the karyotype) penetrates and enters the ovum with its 23 chromosomes (or half of the chromosomes pictured in the karyotype) a zygote or fertilized egg is formed with a full compliment of 46 chromosomes. Immediately the zygote replicates itself over and over millions of times with each new cell containing 46 chromosomes (or all of the chromosomes pictured in the karyotype). Figure 21 shows this process schematically.

Figure 21. Fertilization and New Cell Formation


23
♀ Ovum
23 ♂
Sperm
In fertilization
The ovum is penetrated by the sperm and the two cells meld to become one.
46
zygote
46
46
46
46
46
46
The zygote replicates itself over and over again.

All of the cells, that is, except one ... the sex cell. Why is there a difference in the number of chromosomes in most body cells and the sex cells? Figure 22 represents Meiosis, which is the type of cell division which results in sperm and ova with only 23 single chromosomes rather than 46 which are found in other cells. Only two pairs of chromosomes are represented for simplicity.

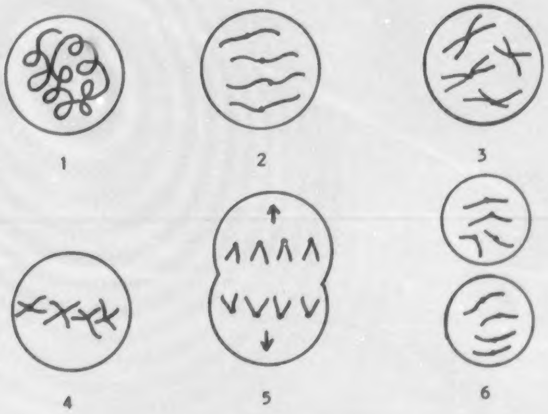
Figure 22. Meiosis.



1. The cell is between divisions and the chromosomes appear as scattered threads.
2. When the cell is ready to divide the chromatin shortens, thickens and coils. The chromosomes are joined in the center by the centromere.
3. The chromosomes form pairs.
4. The cells line up in an ordered arrangement and duplicate themselves.
5. The cells now separate.
6. Two cells are formed, each with a single member of each pair of chromosomes.
7. The chromosomes in these cells split in half.
8. A total of four new cells are formed, each with one chromosome from each original pair.

Mitosis is the division of body cells resulting in the formation of new cells with exactly the same chromosome content as that of the original cell. The process is represented in Figure 23. Only two pairs of chromosomes are represented for simplicity.

Figure 23. Mitosis.



1. The cell is between division and the chromatin appears scattered and threadlike.
2. The cell is preparing for division and the chromatin shortens, thickens and coils. The chromosomes are joined in the center by the centromere.
3. Each chromosome duplicates itself.
4. The duplicated chromosomes line up across the center of the cell.
5. The duplicated chromosomes pull apart and move to opposite ends of the cell.
6. Two complete new cells have been formed, each with the same number of chromosomes as the original cell.

THE GAMBLE: ABNORMAL CELL DEVELOPMENT

The wonder in human development is not that 3% of individuals are born mentally retarded, but that so many infants are born healthy, normal and "whole" -- wonderous, miraculous human beings. When the genes make an error in assembling "a new model" it may be because of a gene carried from previous generations, or it may happen as the fertilized egg begins to grow.

Let's look at some lists of possible genetic errors just to give you a feeling of the extent and diversity of genetic disorders. Don't worry about unfamiliar terms, just get a feel for extent and diversity.

First of all, it is important to realize that many genetic disorders are related to ethnic groups or particular populations. Some genetic disorders occur at a higher frequency in particular populations, as figure 24 illustrates.

Figure 24. Genetic Disorders at High Frequencies in Particular Populations.

Population	Disorder Found in Relative High Frequency
Africans	Hemoglobinopathies, β-thalassemia, G6PD deficiency, Adult Lactase deficiency
South Africans	Variegate Porphyria
Armenians	Familial Mediterranean Fever
Ashkenazic Jew	Abetalipoproteinemia, Bloom's Syndrome, Dystonia musculorum deformans, Familial dysautonomia, Factor XI deficiency, Gaucher's disease, Meckel's syndrome, Iminoglycinuria, Neimann-Pick disease, Pentosuria, Spongy degeneration of brain, Tay-Sachs disease
Asians, S.E.	α-Thalassemia
Australians	Cystic fibrosis of the pancreas
Blacks	Sickle cell anemia
Canadians	Tyrosinemia
Chinese	α-Thalassemia, G6PD deficiency, Adult Lactase deficiency
England, N.E.	Duchenne Muscular Dystrophy
Eskimos	Adrenogenital Syndrome
Europeans, N.E.	Cystic Fibrosis
Europeans	Phenylketonuria
Finns	Congenital Nephrosis
Irish	Neural Tube Defects
Japanese	Acatalasia, Oguchi's Disease, Dyschromatosis
Italians, Greeks	Thalassemia, G6PD Deficiency
Sephardic Jews	Familial Mediterranean Fever, Type III Glycogen Storage Disease
New Zealand	Myotonic Dystrophy
Norwegians	Cholestasis-lymphedema
Scottish	Phenylketonuria
Tasmanians	Huntington's Chorea

Not only are gentic defects many times of relatively higher incidence in specific populations of people, but they are widespread. The list is extensive and continues to grow daily, as new genetic syndromes are discovered and new ones created by the possible causation factors of:

- atmospheric pollutants
- maternal sex hormones
- medical and dental radiation
- radiation from the sun
- radiation from other solar systems
- virus infections
- drugs
- chemicals
- delayed union of ova and sperm
- body temperature variations
- antibody production mechanisms
- spontaneous mutations

Figure 25 gives you a feel for the great variety and number of genetic caused defects often associated with mental retardation or mental degeneration. Again, don't be at all concerned with technical jargon. Only realize at a glance the possibilities and extent of genetic defects.

Figure 25. Some Genetic Defects Associated with Mental Retardation.

Malformation Syndrome	Malformation Syndrome
Agininemia	Isovaleric aciduria
Arginosuccinicaciduria	Laurence-Moon-Biedl Syndrome
Anophthalmia	Lesch-Nyhan Syndrome
Apert's Syndrome	Lissencephaly Syndrome
β-Alaninemia	Maple Syrup Urine Disease
Aqueductal Stenosis	Marinesco-Sjorgren Syndrome
Beckwith-Wiedmann Syndrome	Meckel's Syndrome
Carpenter's Syndrome	Median Cleft Face Syndrome
Cephaloskeltal Dysplasia	Menke's Disease
Cerebrohepatorenal Syndrome	Methylmalonic Aciduria
Chotzen Syndrome	Methylcrotonylglycinuria
Citrullinememia	Microcephaly
Cockayne Syndrome	Micromelia
Coffin's Syndrome	
COFS Syndrome	Neural Tube Defects
Conrade's Disease	Nonketotic Hyperglycemia
Craniodigital Syndrome	Noonan's Syndrome
Crouzon's Disease	Oculocerebrorenal Syndrome
Crigler-Najjar Syndrome	
Cretinism	Oral-facial-digital Syndrome
deLange Syndrome	Osseous Dysplasia
Dyschondroplasia	Osteopetrosis
Dysmorphogenesis of Brain	Otopalatodigital Syndrome
Ectodermal Dysplasia	Phocomelia Flexion
Ellis-van Creveld Syndrome	Phenylketonuria
Facial Dysmorphism	Proprionicacidemia
Fanconi's anemia	
Galactosemia	Pycnodysostosis
Goltz's Syndrome	Pryruvic Acidosis
Hartnup's Disease	Robert's Syndrome
Hypogonadism	Rothmund-Thomson Syndrome
Hexanoic Aciduria	Saccharopinuria
Holotelencephaly	Sacrosinemia
Homocystinuria	Seckel's Dwarfism
Hyperammonemia	Smith-Lemli-Opitz Syndrome
Hyperargininemia	Sulfite Oxidase Deficiency
Hypervalinemia	Telecanthus Syndrome
Hyperbilirubinemias	Treacher Collins Syndrome
Ichtryosiformerthodermy	Wilson's Disease
Incontinentia Pigmenti	Xeroderma Pigmentosum

How does all this happen? How does abnormal cell development of an individual begin?

There are five basic mechanisms in the genetic process that cause genetic defects and subsequent mental retardation.

#1. Defective dominant or recessive gene inheritance carried by the autosomes.

#2. Defective dominant or recessive gene inheritance carried by the X sex chromosomes.

#3. Chromosome errors such as breakage, relocation and non-division.

#4. The interaction of more than one defective gene on the individual.

#5. The interaction of one or more defective genes with the environment.

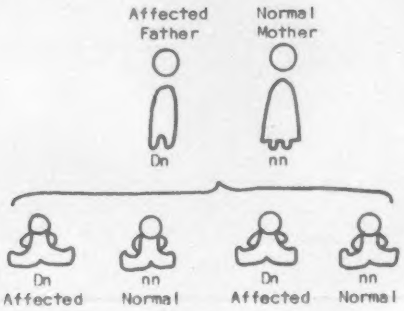
1. How Does Dominant Inheritance Work?

A dominant gene determines certain characteristics of an individual no matter what the nature of the matching or paired gene on the matching or paired chromosome. One affected parent has a single faulty gene which dominates its normal counterpart. Each child's chances of inheriting either the defective or the normal gene from the affected parents are 50%. See Figure 26. There are 943 known deleterious dominant genetic defects. Dominant defects are not as prevelant in the population as recessive genetic defects because many individuals affected by defective dominant genes:

1. Die in the uterus because they are so seriously impaired.
2. Are seriously impaired in fertility, so they do not pass on their defective genes.
3. Are too handicapped to marry.

Most of the normal genes involved in patterning enzymes are dominant as are most of the genetic defects involving skin abnormalities stemming from central nervous system defects and some growth disorders. Some of the dominant genetic diseases do not appear at birth, but surface later on in life, such as muscular dystrophy and Huntington's disease.

Figure 26. The Dominant Odds.



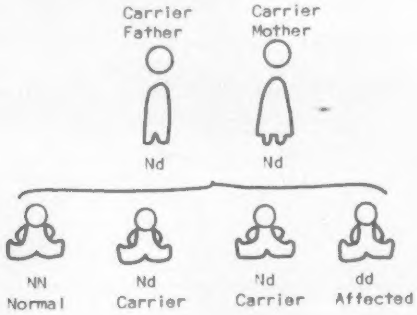
2. How Does Recessive Inheritance Work?

A recessive gene determines certain characteristics only if both parents (who are usually themselves unaffected) carry the same recessive gene at the exact same position within its paired chromosome. The odds for each child are:

25% chance of inheriting two defective genes
25% chance of inheriting normal genes
50% chance of being a carrier with one defective gene, but having a normal gene to mask the defective one.

See Figure 27. Recessive defective genes are relatively rare, but their expression is greater than dominant defective genes because there are more carriers and the defects as a group are less severe than dominant defective gene caused defects. There are over 783 known recessive gene caused defects, and they play a much bigger part in the causation of mental retardation than do the dominant gene defects.

Figure 27. The Recessive Odds.



3. How Does X-Linked Inheritance Work?

Defects linked to the sex chromosomes can be either dominant or recessive. The defective gene is carried within the X chromosome of the male or of either of the female X chromosomes. The X chromosome carries a full supply of genes, but the Y chromosome is almost completely barren of genes but determines the "maleness" of the child. No Y-linked gene defects have yet been discovered. There are 150 known X-linked disorders.

In the most common form, the female sex chromosome of an unaffected mother carries one faulty gene and one normal gene. The father has the normal X and Y chromosome. The odds for each male child are:

50% risk of inheriting a defective X
50% chance of inheriting a normal X and Y

The odds for the female child are:

50% risk of inheriting a defective X, but only as a carrier
50% chance of inheriting no faulty gene

See Figure 28. When a man carries a defective X-linked gene, all the sons will be normal and all of the daughters will be carriers. See Figure 29.

The sons are clearly more at risk of being effected by X-linked gene defects. The daughters one defective X can be masked by a normal dominant gene in the father's X chromosome. But in the son there is no offsetting effect because there are no masking genes in the Y chromosome.

There are more males than females with mental retardation both in state hospitals for the mentally retarded and in the general population. This greater ratio of males to females is most pronounced among the severely retarded. As many as 20% of boys in the 30-55 I.Q. range may be retarded on the basis of X-linked inheritance.

Figure 28. The Odds When the Mother Carries a Faulty X-Linked Gene.

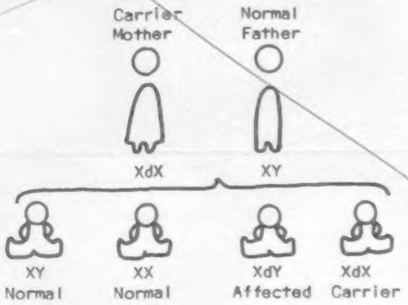
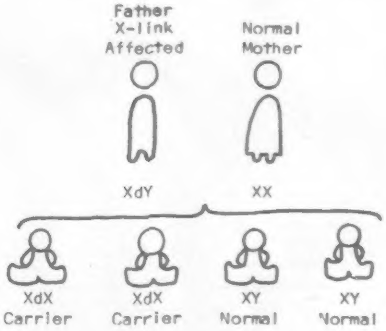

Carrier Mother
Normal Father
XdX
XY
XY Normal
XX Normal
XdY Affected
XdX Carrier

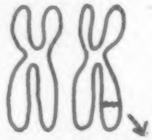
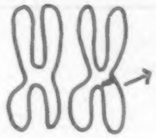
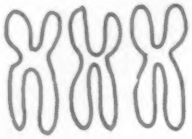
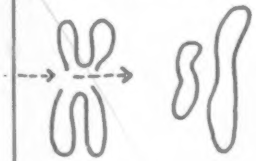
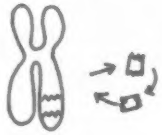
Figure 29. The Odds When the Father Carries a Faulty X-Linked Gene.


Father X-link Affected
Normal Mother
XdY
XX
XdX Carrier
XdX Carrier
XY Normal
XY Normal

4. How Does Inheritance From Chromosome Abnormalities Happen?

Chromosome abnormalities may occur when the ova or the sperm are being formed or when the first cell after fertilization of the ovum by the sperm takes place. Something physical happens to the chromosome at either of these times...an accident. Figure 30 summarizes a few of these possible accidents.

Figure 30. Possible Damage to a Chromosome

Chromosome	Damage
	Translocation: A small piece breaks off and travels to another chromosome in a different location and attaches itself to that chromosome. The two chromosomes grow together at the centromere so they appear as one, but contain too much genetic material.
	Deletion: Part or all of either the short or long arm of the chromosome breaks off and becomes lost.
	Nondisjunction: As the parent cells divide after replication, two sets of chromosomes do not split and go to the opposite ends of the daughter cell so that the egg or sperm cell carries an extra chromosome at one location.
	Isochrome: Instead of dividing down the center as in normal replication, the chromosomes divide across the center, forming a short and long chromosome instead of two of equal length.
	Inversion: There is a double break in the chromosome. The broken piece inverts and then refuses into its original place on the chromosome.

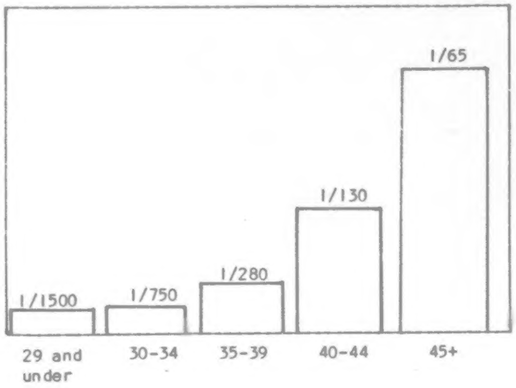
Another chromosome error may be the replication of too many X or Y chromosomes or no replication giving the child either too many (XXXXY) or too few (XO) chromosomes. The child will manifest a number of abnormalities including mild retardation.

The Down's Syndrome Child
High Odds

The Down's Syndrome child is a typical example of chromosome error. Most people are familiar with this type of child. Fifteen to twenty percent of the institutionalized retarded are Down's children. Langdon Down identified this syndrome in 1866. A Down's syndrome child has over 30 characteristics typical of the syndrome some of which are mental retardation, a small head, eyes that slant upward and outward, abnormal palm and sole line markings, a small nose with a low bridge, low set ears, a protruding tongue, a husky, low-frequency voice, broad hands with stubby fingers, broad feet with stubby toes, poor muscle tone, and susceptibility to respiratory infection.

Approximately ½ of all children born with Down's Syndrome are born to mothers 35 years or older. Thirteen percent of pregnancies in this country occur in women over 35. About ½ of the babies with Down's Syndrome are born to women in this age group. Figure 31 shows the relationship of maternal age to Down's Syndrome.

Figure 31. The risk of having a child with Down's Syndrome increases with maternal age.



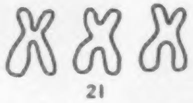
Two theories predominate as to the cause of this phenomenom.

1. The egg of the mother ages as does her body and the ova may be past their prime time for reproduction after 35. Both the ova and sperm have been exposed to more radiation, drugs and environmental effects the longer they have lived.

2. As a couple age, the number of times intercourse takes place is likely to decrease, resulting in a greater time lapse between ovulation and fertilization of the ovum. In this intervening time, the egg and sperm may be subject to aging and environmental hazards.

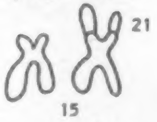
There are three types or genetic causation factors in Down's Syndrome.

1. Nondisjunction: In nondisjunction there are 3 rather than the usual pair of chromosomes in "pair 21". Trisomy usually results from a mistake in cell division of either the egg or sperm. The abnormal fertilized egg has an "overdose" of chromosome 21, which causes Down's Syndrome.



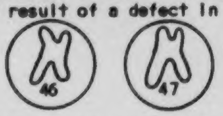
Incidence: Causation factor in 90% of Down's Syndrome
Reoccurrence: One per 100 risk of reoccurrence for mothers who have had one Down's child.

2. Translocation: In translocation, an abnormally large chromosome in the 15th pair has resulted from extra chromosome material from 21 joining with a chromosome at the 15th location. Either a male or female may carry the translocation. Females seem to transmit it more frequently than males.



Incidence: Causation factor in 5% of Down's Syndrome.
Reoccurrence: Twenty per 100 risk of reoccurrence for a mother who has had one Down's child. In translocations not always between 15/21 the risk must be determined by the type of translocation and the carrier involvement of both the mother and father.

3. **Mosaicism:** Mosaicism is the co-existence in an individual of cells with 46 chromosomes (normal) and others with 47 chromosomes (abnormal). Mosaicism, which causes Down's Syndrome, results from an error in cell division soon after fertilization and is not the result of a defect in the ovum or sperm.



Incidence: Causation factor in 5% of Down's Syndrome.
Reoccurrence: ??

5. How Does Polygenic Inheritance Work?

Some genetic defects are thought to be the interaction of two or more genes upon each other and the individual. The same malformation can be caused by different genetic defects. Mild cretinism is an example of this phenomenom. Retardation of an unknown cause may be due to polygenic factors. This could account for the varied estimates of percentages attributed to genetic causation factors in mental retardation.

6. The Interaction of Genes and Environment.

Several minor gene abnormalities interacting with environmental factors such as a difficult birth or a deleterious drug can cause mental retardation. Open spine defects and cleft palate are examples of this interaction. A given hereditary disease can assume various forms in different individuals as a result of environment insult or stress.

THE IMPROVED ODDS

So far it sounds as though the odds are stacked against us, the dice loaded. We will not always win the game, but there is something that can be done to improve the odds . . . That something is GENETIC COUNSELING.

What is it? A genetic counselor who is usually qualified in several medical specialities such as pediatrics and genetics, uses the basic laws governing heredity and knowledge of the frequency of specific birth defects in the population to predict the probability of the occurrence or reoccurrence of a given defect in a family. With the fullest comprehension of all the implications, risks and burdens of the genetic disease and of all the possible alternatives and options open to them, the couple can make a more rational, logical and humanistic decision about childbearing. The counselor can inform a couple about what can be done to treat the disease or to prevent it. Informed couples will make better choices. The man and woman can control the events that shape and effect their life to prevent potential human suffering and misery for a potential child of their union and for themselves.

Who seeks genetic counseling? Ninety percent of those individuals needing genetic counseling do not seek it. Thus, only a small portion of individuals who could benefit from genetic counseling,receive it. The majority of those seeking counseling are from the middle and upper socio-economic class. Less than 5% of families of retarded individuals receive genetic counseling, yet members of these families are at risk as future parents.

Who should seek genetic counseling?

1. A woman seeking an abortion because she has had a previous child with a genetic defect. If she had genetic information the abortion might be avoided when she found the unborn child to be normal. The news from genetic counseling is many times "good news".
2. A couple who have had a previous child with a genetic or chromosomal abnormality.
3. A woman over 35 considering further childbearing.
4. Parents of a mentally retarded child.
5. A man and/or woman who have had either mental retardation or a genetic defect in the family, the family being at least three generations.
6. A man and woman who bear a child who fails to develop secondary sexual characteristics.
7. A woman who has had multiple miscarriages and/or stillborns.
8. A man or woman who have been exposed to excessive drugs, radiation or environmental or industrial pollutants.

What kind of information will be needed in genetic counseling?

1. The genetic counselor will want a detailed family history covering three generations with information on deaths, cause of death, age of death, unusual diseases or illnesses, stillbirths, miscarriages and mental retardation within the family with causation factors if possible.

2. Information on stillbirths, miscarriages and newborn deaths should ideally include:
   a. a complete physical examination
   b. pictures of the birth defect
   c. a complete autopsy
   d. x-rays
   e. genetic studies on blood or tissues

3. A physical exam for the man and/or woman.

4. A karyotype made by taking cells from blood, bone marrow or body tissue and then culturing those cells. The cells are then treated, stained, photographed and arranged in order in pairs from the largest to the smallest. The karyotype is then studied for abnormalities.

A complete chromosomal analysis ranges from $200 to $400. However, the price will soon be dropping. The National Aeronautics and Space Administration (NASA) has developed a computer controlled system for rapid chromosome analysis. The National Medical Center in California has developed an automated system which prepares chromosomes for analysis. It is anticipated that the linkage of these two systems into a fully automated system for chromosome analysis which will permit mass screening will be ready for field testing by 1978.

GIVEN GENETIC COUNSELING, WHAT ARE THE POSSIBILITIES OF THE PREVENTION OF MENTAL RETARDATION?

... The number of Down's Syndrome children born in caucasian populations could be reduced by 1/2 if women stopped having children after age 35.

... Carriers of nearly 60 distinct metabolic disorders associated with mental retardation can be detected and the detectable numbers continue to grow. Figure 32 gives you a visual picture of the array of disorders whcse carriers can be detected.

Figure 32. Disorders associated with mental retardation that can be detected in potential parent.

Metabolic Classification	Metabolic Disorder
Amino Acid Metabolism or Transport	Arginemia Argininosuccinic acidemia Citrullinemia OTC Deficiency Maple syrup urine disease Variants of maple syrup urine disease Propionic acidemia syndrome -Methyl-β -hydorxybutyric acidemia Pehnylketonuria Histidinemia Carnosinemia Sacrosinemia Homocystinuria Cystathioninuria Hartnup's disease Hyper dibasic aminoaciduria
Muccopolysaccharide Metabolism	Hurler syndrome Sanfilippo syndrome Schele syndrome Maroteaux-Lamy syndrome β -Glucceronidase deficiency
Lipid Metabolism	Generalized gangliosidosis Juvenile gangliosidosis Tach-Sachs disease Sandhoff's disease Neimann-Pick disease Gaucher's disease Metachromatic leukudystrophy Crabb's disease Refsum's disease Wolman's disease Mucolipidosis
Carbohydrate Metabolism	Galactosemia Fucosidosis Pyruvate decarboxylase

Other Metabolic Diseases	Lesch-Nyhan syndrome Hereditary orotic aciduria Lysomomal acid phosphatase deficiency Aspartylglucosaminuria

... Family members in which a Down's Syndrome child has been born can prevent reoccurrence by being tested as translocation carriers.

... Pedigree analysis is important in determing x-linked genetic defects and calculating risks of reoccurrence. Carrier detection is available for at least 5 x-linked defects and is important for women with affected males in their families.

... At least 6% of both autosome and x-linked defects are preventable.

... A marriage or mating between first or second cousins should be avoided. The chances of either a deleterious dominant or recessive genes appearing more frequently makes such marriages of high risk in childbearing. In such marriages, the incident of mental retardation is three times that of the normal population.

... If an individual is a carrier of a defective gene, he can be cautious in mate selection, limit their offspring or adopt children.

... If a man or woman is in genetic counseling and opts to have a child even though they know they are a carrier and the child is born with a genetic defect, the genetic counselor can advise them of early treatment and care. The counselor can also refer them to the appropriate professionals to give the child an optimal chance of care and/or development.

Why is genetic counseling so infrequently used?

When it comes to our physical and, in particular, our genetic make-up we all feel vulnerable and fragile. We fear being at fault or "wrong". Admitting one is at fault is probably one of the hardest things human beings face. We may also have a feeling of helplessness. Actually, with sound genetic counseling, we could feel just the opposite. We could be more in control of our lives. MOST IMPORTANT OF ALL, WE MUST CONSIDER THE POTENTIAL CHILD. The person who is caught in the center who may face a tragic death or a life of frustration and misery because we could not be threatened by looking at ourselves genetically and decreasing the odds of chance.

As more tests are developed and refined to detect genetic disease, they may be used as a vital part of a general health exam or as a couple seeks a marriage license. The best time to get advice is *before* marriage or *before* considering bearing children.

Pre- Test

Cognitive

1. Structures which are present in every cell and are made up of genes carrying hereditary traits are

_____ a. eggs
_____ b. sperm
_____ c. chromosomes

2. The ___________ are small particles of hereditary material grouped together in a specific sequence to make up the chromosomes.

_____ a. karyotypes
_____ b. genes
_____ c. mitosis

3. The 22 pairs of chromosomes within the nucleus of a cell other than the sex chromosomes.

_____ a. autosomes
_____ b. sex chromosomes
_____ c. dominant genes

4. The 23rd pair of chromosomes in each cell designated XX in females and xy in males are the

_____ a. karyotypes
_____ b. sex chromosomes
_____ c. autosomes

5. A charting system devised by scientists for numbering, pairing chromosomes by size and shape and arranging them in an order to study is

_____ a. karyotyping
_____ b. a genetic defect
_____ c. an autosome

6. Approximately ____% of mental retardation is caused by genetic defects.

_____ a. 5
_____ b. 25
_____ c. 50

7. Two possible causes of damage to genes to make them defective are

_____ a. exercise and lack of sleep
_____ b. prematurity and lack of prenatal care
_____ c. radiation and drugs

8. Multifactorial inheritance refers to a defect caused by

____ a. one gene
____ b. polyesters
____ c. genetic and environmental factors

9. A _______ gene determines certain characteristics of an individual no matter what the nature of the matching gene.

____ a. dominant
____ b. recessive
____ c. X-linked

10. A _______ gene is clearly expressed only when matched by another gene of its kind.

____ a. dominant
____ b. recessive
____ c. sex linked

11. A sex linked defect can be carried by the

____ a. mother
____ b. father
____ c. mother or father

12. A chromosome defect can be caused by the ______ of a chromosome during cell division.

____ a. breaking
____ b. relocation
____ c. both of the above

13. The genetic counselor

____ a. advises you as to your risks and alternatives in having children.
____ b. tells you whether or not to have children.
____ c. neither of the above.

14. The genetic counselor will probably need _______ to advise you as to the genetic risks you have in childbearing and what some of the alternatives are.

____ a. a family medical record
____ b. a karyotype
____ c. both of these

Key: 1.c, 2.b, 3.a, 4.b, 5.a, 6.a, 7.c, 8.c, 9.a, 10.b, 11.a, 12.c, 13.a, 14.c.

Affective

Circle the word or words that best describe the intensity of your feelings.

1. My own genetic make-up is important to the quality of life of my potential children.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

2. I as well as everyone else carry five to eight defective genes in my genetic make-up.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

3. A genetic counselor can advise me as to some of the risks I may or may not be taking in childbearing.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

4. I will be able to make a better decision about childbearing if I receive genetic counseling.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

5. I would like to keep my own family medical record.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

6. I feel that I must determine if I am a high risk potential parent.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

7. I feel that I would like to receive genetic counseling as a potential parent.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

Mini-Lecture or Presentation

If possible introduce this area of study with:

Genetics and You #14

or

From Generation to Generation #14

"The Game of Genetic Gamble"

Student Involvement:

Have the students pick up a set of Karyotype Chromosomes, a red pencil and scissors as they come into the room. (Chromosomes prepared from ditto #26.) The game goes like this.

1. The players (the students) move around the room with their karyotype chromosome paper, talking - visiting until the instructor tells them to choose a partner of the opposite sex, as numbers allow.

2. The players are to put many D's and r's in a sequence inside the chromosomes, with a pencil, except in the y chromosome.

3. Now the players make 2 to 4 r's in red scattered at random in the chromosomes of their karyotype. Privately tell one student to make a red D.

4. Each set of partners cut out one chromosome from each of the numbered sets in their karyotype and place it on their master card (prepared from ditto #27), to form one karyotype from their two separate sets of chromosomes. For example, two partners each cut out one of the chromosomes at the number 15 location. They put these two number 15 chromosomes on their master sheet at location 15.

5. The players continue this process until they have a master sheet with 23 sets of paired chromosomes.

6. Each set of partners study their new karyotype to note any:
   a. Red r's that have paired at the same position on a chromosome pair
   b. Red D on any chromosome
   c. Chromosomes that are lettered instead of numbered
   d. Chromosomes without D's or r's

"Explanation of the Game of Genetic Gamble"

Your game board actually represents a karyotype ... a picture of chromosomes made by taking a blood, bone marrow or tissue sample from an individual, treating and staining the cells, photographing the cell when it is dividing, cutting apart the chromosomes that have been photographed in that cell and arranging them in pairs from the largest to the smallest. It is one way in which your and my genetic make-up can be studied for possible defects that we may carry around with us but may not know about until the defect appears in the future in our children. Remember in "the pie of causation" we saw that 5% of all mental retardation is caused by genetic defect - by those chromosomes you have in front of you. The 4-8 red D's or r's that you marked in the chromosomes stand for serious genetic defects. That's how many each of us carry around in us -- 4 to 8 defective genes. Many genetic defects are so serious that 10% of the residents of state institutions are those with hereditary diseases. Over 100,000 genetically defective infants are born each year in the United States resulting in a future commitment of care by society that is in excess of two billion dollars in terms of medical, custodial and special training costs, grief and guilt for parents and often misery and loneliness for the retarded child.

"Where and How the Game of Chance Takes Place"

Draw a circle or something that approximates a circle around your karyotype. The chromosomes are not in this arrangement within the cell but nevertheless they do make up the most important part of cell life, for it is within the cell that all new life processes occur.

The chromosomes that you have in front of you are greatly magnified. Actually, they are minute thread-like structures located inside the nucleus of every living cell that carry hereditary traits. (A blackboard illustration would be helpful.)

Student Involvement:

Ask for the following observations:

1. How many chromosomes are there in your karyotype or your cell? 46.

2. How many are numbered? 44. These are called autosomes.

3. How many are lettered? 2. These are the sex chromosomes. If your karyotype has XX for the last set of chromosomes it pictures a female's cell. All females have two X chromosomes. If it has XY it pictures a male's cell. All males have one X and one Y chromosome.

4. How many of you have more than a combination of 15 D's and r's within one chromosome? Actually, each chromosome is composed of tens of thousands of genes. Genes are the smallest particle of hereditary information that are put together in a specific sequence to make up the chromosome. These genes are made up of proteins which are called enzymes and direct the life and quality of life of each cell. The genes are arranged in a specific sequence to make up a chromosome. A gene for a particular trait on one chromosome has a gene for that same particular trait on its paired chromosome. So the genes as well as the chromosomes they reside in come in pairs.

5. How did the pairs of chromosomes get together? How did a D gene pair itself with an r gene? Right, each set of partners gave half

of the chromosomes needed to make up the whole karyotype. The sperm and the ovum contain only half of the chromosomes pictured in your karyotype, or 23. When the ovum and sperm merge in fertilization during intercourse, the new cell or zygote has the full compliment of chromosomes or 46, and has received an X chromosome from the woman and either an X or Y chromosome from the man. Immediately the zygote makes a copy of itself over and over again millions of times with each new cell containing 46 chromosomes. The gamble has been taken..a new human being is rapidly developing.

"The Unfavorable Odds...Abnormal Cell Development"

By statistical odds, we would need 15 more (based on a class of 32) karyotypes than the 15 we already have for the odds to produce a retarded child. So if we put two classes of this size together and made karyotypes, the statistical risk would produce one mentally retarded infant and 33 normal infants.

The wonder of human development is not that 3% of individuals are born mentally retarded, but that so many infants are born healthy, normal and "whole" -- wondrous, miraculous, human beings. However, genetic defects can and do occur. They occur because of a gene defect carried from previous generations, because of damage to a newly formed ovum or sperm or because cell damage occurs as the newly fertilized egg begins to grow.

Student Involvement:
Ask for the following observations:

1. How many of you have either a red D on one of the chromosomes in your karyotype, or red r's at the same position on a pair of chromosomes? Even though thousands of genes are healthy, normal genes, each one of us carry from 4 to 8 undesirable or harmful genes in our cells. These gene defects are represented in your karyotype by red D's or r's. A defective gene can be caused by:
    - atmospheric pollution
    - maternal sex hormones
    - radiation from medical or dental x-rays
    - radiation from the sun
    - radiation from outside of our solar system
    - the delayed union of the ovum and sperm
    - body temperature variations
    - antibody production mechanisms
    - spontaneous mutations

2. Just in your own minds, answer the question - Of what nationality are you? Do you realize that many genetic disorders are related to ethnic groups or particular populations of people? For instance, a disorder found in relatively high frequency in Jewish people coming from Central and Eastern Europe is Tay-Sachs disease; in the Irish-spinal cord and column defects; in the Scottish-PKU; in Tasmania-Huntington's chorea.

These are but a few examples of genetic disorders which are found in high frequency in particular populations and cause mental retardation or mental disintegration.

3. How many of you have a red D somewhere on one of the chromosomes in your karyotype? The red D represents a dominant gene that is defective. Let's see what that can mean for the hypothetical child who is formed with this karyotype. That dominant gene will determine a specific characteristic of the child no matter what the nature of the matching or paired gene.

4. What is the red D matched to on the paired chromosome in your karyotype? The affected parent has a faulty gene, which he or she passed on to the child and it dominates its normal counterpart. The dominant gene masks out the normal one...it is more active. A child's chances of inheriting either the defective gene or a normal gene from the affected parent are 50-50, with every child. Chance has no memory. (A blackboard illustration would be helpful as in Figure 26.) There are 943 known serious dominant genetic defects. The chances of you or me carrying a dominant defect is slight because those affected by a dominant defect usually: 1) die before birth, 2) are infertile, or 3) are too handicapped to marry. Therefore they do not pass on the defect to a new generation.

5. Are there any partners who have a red r on one chromosome with a red r on the paired chromosome in the same position or location on the autosomes? The infant with two red r's, two recessive genes which are both defective has different odds for being born mentally retarded. A recessive gene determines certain characteristics only if both parents who usually are unaffected by the defective gene they carry, carry the same recessive gene at the exact same position within its paired chromosome. The odds for each child are:

    25% chance of inheriting two defective genes
    and thus the disease
    25% chance of inheriting normal genes
    50% chance of inheriting one defective gene
    at that location, but having a normal
    dominant gene to mask the defective one.

    (A blackboard illustration as in Figure 27 would be helpful.) There are over 783 known recessive gene caused defects, and they play a much bigger part in causation of mental retardation than do dominant defects.

6. Did any of you put the red D or red r's on the Y chromosome? The mechanism for passing on a defective gene contained within the X or Y chromosome is very much the same as in the autosomes, except for one big difference. The X chromosome carries a full supply of genes, but the Y chromosome is almost completely barren or void of genes except for the gene that determines the maleness of the child.

7. Are there any partners that have an XY in their karyotype with a red r or D on the X chromosome? Boys are clearly more at risk of being effected by the defective D or r, dominant or recessive gene carried within the X chromosome for their Y chromosome has no genes to mask or dominate that defective gene on the X chromosome. If the defective gene is recessive, a red r, the risk of the child being defective is 50% for males and 25% for females. If the gene is dominant, a red D, the risk of the child being genetically defective is 50% both for males and females. (A blackboard illustration of Figures 28 and 29 can be used to illustrate X-linked risk factors.) There are over 150 serious genetic defects caused by X-linked inheritance. There are more males than females in both the regular populations and in state institutions for the mentally retarded. X-linked inheritance may be one explanation for this.

Besides dominant and recessive inheritance via the autosomes and sex chromosomes there can also be damage to the chromosomes either in the cell division and formation of the sperm and ova, or in cell division immediately after fertilization when the zygote replicates itself. We are going to illustrate some hypothetical damage to the chromosomes in your karyotypes to see if we can get some more of these genetic mechanisms into our minds.

A great variety of chromosome errors cause syndromes which result in specific characteristics in an affected child. A syndrome that is well known and fairly common is Down's Syndrome. Fifteen to twenty percent of the institutionalized retarded are Down's Syndrome children. A Down's Syndrome child has over 25 typical characteristics. Each mental retardation syndrome typically has its array of physical characteristics. Some of the outstanding characteristics of a Down's Syndrome child are:

- mental retardation
- a small head
- eyes that slant upward and outward
- abnormal palm and sole line markings
- a small nose with a low bridge
- low set ears
- a protruding tongue
- a husky-low frequency voice
- broad hands with stubby fingers
- broad feet with stubby toes
- poor muscle tone
- susceptibility to respiratory infection

Such a syndrome is caused by chromosome damage in one of the parents.

Student Involvement:

A. At the 21 location in your karyotype draw an extra chromosome. This is called trisomy 21, and it usually results from a mistake in cell division of either the ovum or sperm. There is too much genetic material at the 21st location.

B. Now take the extra chromosome at the 21st location and attach it to one of the chromosomes at the 15th location. Again the child will have too much chromosome material, which will result in a Down's child.

C. Using just two sets of students (two sets of partners) have one set take one of the chromosomes at the 21st location and give it to the other partners. They put the extra chromosome at the 21st location. The cell containing only 45 chromosomes dies. One of the cells of a developing embryo retains a chromosome meant for its sister cell and passes the extra chromosome to its descendants. The cell containing only 45 chromosomes dies. There are then two living cell populations with different chromosome counts: 46 and 47. Mosaicism results in a Down's Syndrome child. This phenomenon takes place immediately after fertilization as the cells begin to divide and multiply.

D. Now take your scissors and cut out part of a chromosome from your karyotype. This is called a deletion. A piece breaks off and becomes lost, resulting in a defect which includes mental retardation.

E. Now take that little part you cut out of a chromosome and just turn it around and put it back in the chromosome. This is an inversion and can cause genetic defects.

F. When a chromosome divides before forming a new cell, it normally divides down the middle. However, sometimes a chromosome divides across the center. Use another chromosome to make this split. This is called an isochrome. Again a serious defect may result.

These processes illustrate a few ways in which chromosome damage may occur resulting in a typical syndrome and mental retardation.

8. How many of you have put more than one red or defective gene on your paper chromosomes? In many types of mental retardation, particularly the milder types, more than one gene may be involved as well as the interaction of factors in the environment such as difficulty at birth, infection or radiation before birth. In other words, the pinpointing of cause in genetic defects is not always so clear as in the game we have been playing.

"Improving the Odds of the Gamble"

It sounds as though the cards are stacked against us...the dice loaded. But a man and woman can do something to improve the odds and that something is GENETIC COUNSELING. (Use transparency #23 to represent genetic counseling.) Ideally genetic counseling should be done before marriage or before a man and woman have children.

A genetic counselor is a medical specialist who uses the basic laws of heredity and knowledge about how frequently mental retardation and birth defects occur in the population to predict the chances of a specific genetic defect occurring in the child of the man and woman. As a man and woman understand all the problems, risks, burdens, alternatives and options related to the genetic disease, they can make a more rational, logical and humanistic decision about childbearing. The informed couple can make better choices...have more control over their lives and prevent potential human suffering and misery.

Think of your own family. Not just your mother and dad, but sisters, brothers, aunts, uncles, cousins, grandmothers and grandfathers. Jog your memory back even further if possible. You are men and women made up of genetic material from your relatives and ancestors.

It is recommended that the following men and/or women seek genetic counseling:

1. A man or woman who has a genetic or chromosome caused defect in his/her family(covering at least three generations).
2. A man or woman from an ethnic group which carries a high risk defect.
3. A man or woman who has had a child with mental retardation or genetic defect.
4. A man or woman who has a family in which numerous miscarriages or stillbirths have occurred or a woman who has had miscarriages or stillbirths.
5. A man or woman who has been exposed to excessive drugs, radiation or unusual industrial or environmental hazards.
6. A woman seeking an abortion because of bearing a previous child with a defect or because of having a defect within the family. The baby may be perfectly normal.
   (Use transparency #24 to represent the responsibility a man and woman have in determining if they are of high risk genetically.)

The third responsibility that a man and woman must take to prevent or lessen possible mental retardation in their potential children is to keep a complete medical record and family history covering at least three generations. (Use transparency #25 to represent the responsibility of keeping a medical record and family history.) Such a record should include:

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1. Age and causes of death in your family for three generations.
2. Diseases and illness in your family for three generations.
3. Stillbirths and miscarriages in your family for three generations.
4. Mental retardation and its causes in your family of three generations.
5. Birth defects in your family of three generations.
6. Your blood type and those of family members.
7. Your immunization record.
8. Allergies.
9. Hearing and visual defects in your family of three generations.
10. Recurring family diseases in your family of three generations.
11. Surgery.
12. Medications and x-rays.

A family and individual health record faithfully kept and passed along to potential children as they mature can do much to provide for the well-being of the generation still to be born.

If a man and/or woman seeks genetic counseling, the genetic counselor will want to obtain or do:
1. A family history.
2. A family medical record.
3. Biochemical tests on blood and urine.
4. Make a karyotype by taking some blood, bone marrow or body tissue and then culture those cells. He will then treat, stain, photograph and arrange them in order in pairs from the largest to the smallest. The karyotype will then be studied for abnormalities.

"The Improved Odds"

Pretend that you are a genetic counselor. What are the possibilities of preventing mental retardation if a man and woman seek genetic counseling? Have various class members read the genetic counselor's response. (Prepared from ditto #28-36.)

Genetic Counselor 1.
A man or woman who carries one of any of 60 distinct disorders of metabolism associated with mental retardation can be detected.

Genetic Counselor 2.
A man or woman in whose family a Down's Syndrome child has been born can prevent reoccurrence if they are a translocation carrier by being tested as a carrier.

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Genetic Counselor 3.
A family history or pedigree of a man and/or woman is important in determining X-linked genetic defects. Carrier detection is available for at least five X-linked defects and is important for women with affected males in their family.

Genetic Counselor 4.
At least 6% of both autosome and X-linked defects are preventable.

Genetic Counselor 5.
The number of Down's Syndrome children born in caucasion populations could be reduced by 1/2 if women stopped having children after age 35.

Genetic Counselor 6.
You should be aware of the mental retardation syndromes found in high incidence in your particular ethnic group and receive genetic counseling regarding these syndromes.

Genetic Counselor 7.
A marriage between first or second counsins should be avoided because deleterious genes appear more frequently in such marriages.

Genetic Counselor 8.
If you are a carrier you should be cautious in mate selection or consider adopting or limiting children.

Genetic Counselor 9.
If you choose to have a child and take the risk as a carrier, let me refer you to appropriate professionals if the child is born with a genetic defect, so that the child can have optimal care and development.

☐ **Classroom Experience Options**

1. Have the students develop a family tree.
2. Using the Immunization record form from Metropolitan Life Insurance Company, have each student complete the form either in class or at home. ⬡ #22
3. Using the National Foundation March of Dimes Family Medical Record, have each student begin one of their own. ⬡ #20
4. Speakers:
   a. Invite someone from the March of Dimes to speak to your class on the prevention of genetic birth defects.
   b. Invite the biology teacher to give a presentation on genetics: Why there are differences in people.
   c. Invite a parent of a child with a genetic disease to relate their experiences of care and education of that child to the class.
5. Have class members work in groups to learn of one specific genetic birth defect and give a report on it. Use the March of Dimes as a resource. ⬡ #20.
6. Discuss: What are some of the specifics that each individual brings to a marriage? Encourage discussion of our physical strengths and weaknesses.
7. Role play: A man and woman have had genetic counseling, and they know that they both carry the same defective recessive gene. They are discussing whether or not they should marry.
8. Use some of the following pamphlets as handouts and for discussion:
   a. Chromosome 21 and Its Association With Down's Syndrome.
   b. Genetic Counseling.
   c. The Right To Be Well-Born.
   d. Spina Bifida and Hydrocephalus.
   e. Diabetes and Other Inborn Errors of Metabolism.
   f. Tay-Sachs Disease.
   g. Chromosome Abnormalities and Down's Syndrome.

   All of the above available from ⬡ #20

   h. Facts About Mongolism For Women Over 35. DHEW Pub. No. (NJH) 77-536 ⬡ #5
   i. Inheritance and Mental Retardation. ⬡ #24
   j. Genetic Counseling in Family Planning. ⬡ #31
9. Show a film as an introduction, extension or reinforcement of the presentation:

   a. Title: Genetics and You*
   Time: 11 min. color film junior and senior high school
   Content: This film puts the subject of genetics into a more personal perspective for the student. It covers some of the key breakthroughs in this growing field. Detailed film animation illustrates our present understanding of the mechanisms of heredity.
   Available from: ⊛ #9
   *Pending Purchase

   b. Title: From Generation to Generation: Genetic Counseling
   Time: 19 min. record and filmstrip senior high school
   Content: Genetic Counseling - screening techniques, prenatal diagnostic tests, family involvement in genetic counseling; Human Genetics - chromosomal errors, dominant mode of transmission, recessive mode of transmission, sex-linked transmission. Discusses a number of genetic linked syndromes and diseases.
   Available from: ⊛ #14

   c. Title: Mental Retardation, Causes and Prevention: Genes, Chromosomes and Mental Retardation
   Time: 15 min. color filmstrip and cassette tape senior high school
   Content: Discusses effects of defective genes and errors in cell division and their modes of transmission. Puts forth genetic counseling as a prevention of mental retardation possibility.
   Available from: ⊛ #9

   d. Title: Down's Syndrome
   Time: 15 min. color filmstrip and cassette tape junior and senior high school
   Content: Identifies the causes of Down's Syndrome and the characteristics of the syndrome. Discusses the treatment of Down's Syndrome children.
   Available from: ⊛ #9

   e. Title: Heredity: Prenatal Care Training Program
   Time: 15 min. color slides and cassette junior and senior high school
   Content: Discusses how genes affect development and how errors take place. Describes genetic counseling and the preventive aspects of heredity problems.
   Available from: ⊛ #9
10. Look at cells through a microscope prepared from an onion tip slide.

Outside Classroom Experience Options

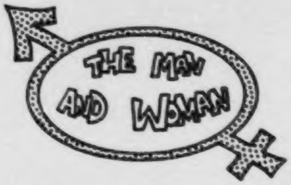
1. Have a small group of students investigate what agencies in the community provide or refer individuals for genetic counseling. Find out costs, procedures, availability.
2. Interview married couples that you know well and see if they have had genetic counseling or even considered it before having children.
3. Visit a laboratory where chromosome workups are done. Observe the process.
4. Visit a state hospital to talk to the biochemist or doctor familiar with the genetic incidence and problems with the state hospital population.
5. Have a karyotype made using a teacher or student volunteer.
6. Visit a school for retarded children and observe the education of Down's Syndrome children in process.
7. Volunteer time to work with retarded children at a local agency or school caring for or educating mentally retarded children.

Post Test

Give the same test used in the pretest. Let the students see how many answers that they did not know originally that they can now correct. Use as an in class or take home test. Determine the individual and class gains.

✓ **Action Checklist**

Pass out an action checklist to each student as a summary for this area of study. Encourage them to consider each point as a choice in their lives. (Prepared from ditto #37.)



I want to:

____ Keep my own medical record, covering at least three generations if possible.

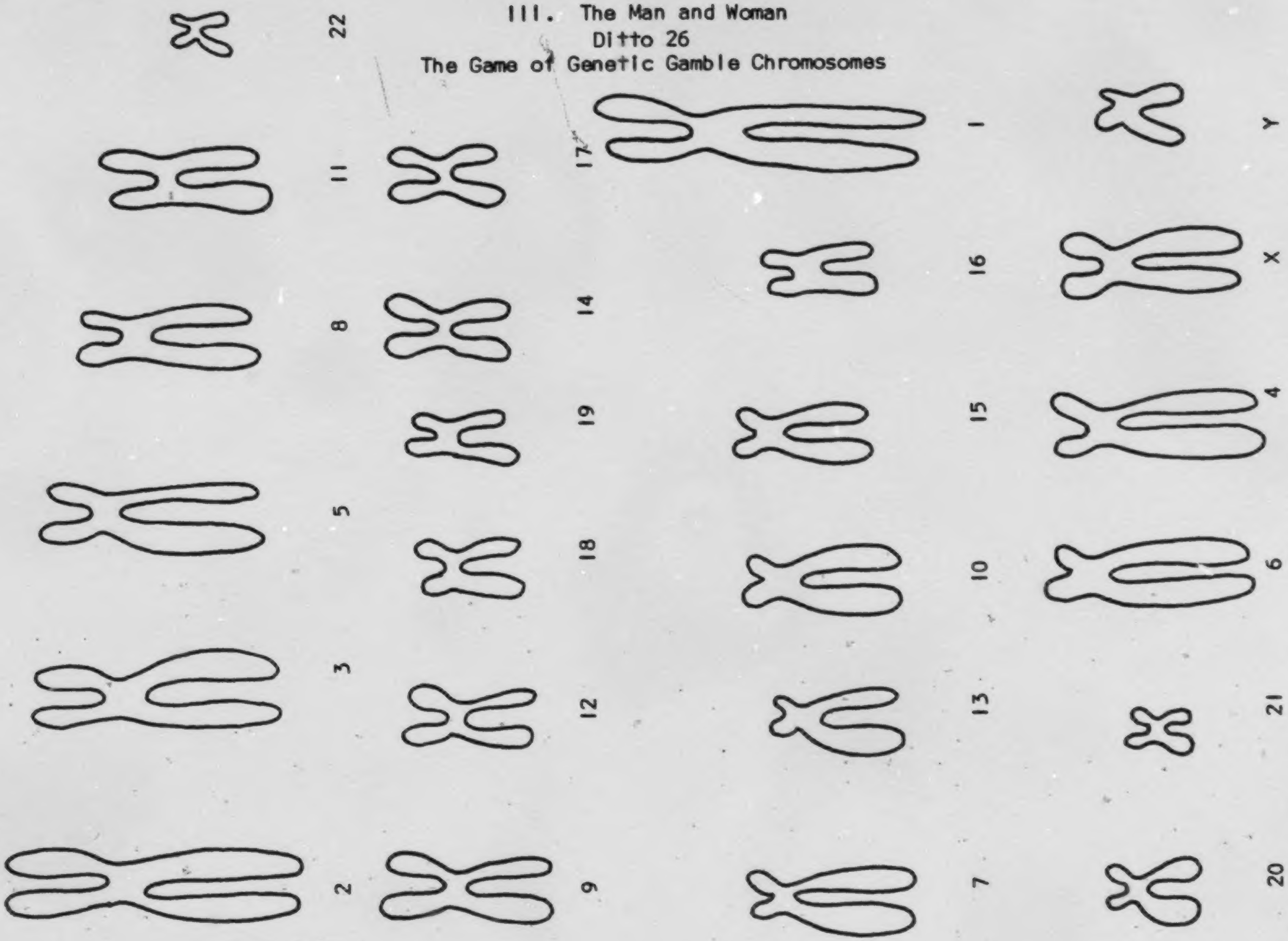
____ Determine if I am genetically a high risk potential parent.

____ Receive genetic counseling before bearing children if I am potentially a high risk parent.

III. The Man and Woman

Ditto 26

The Game of Genetic Gamble Chromosomes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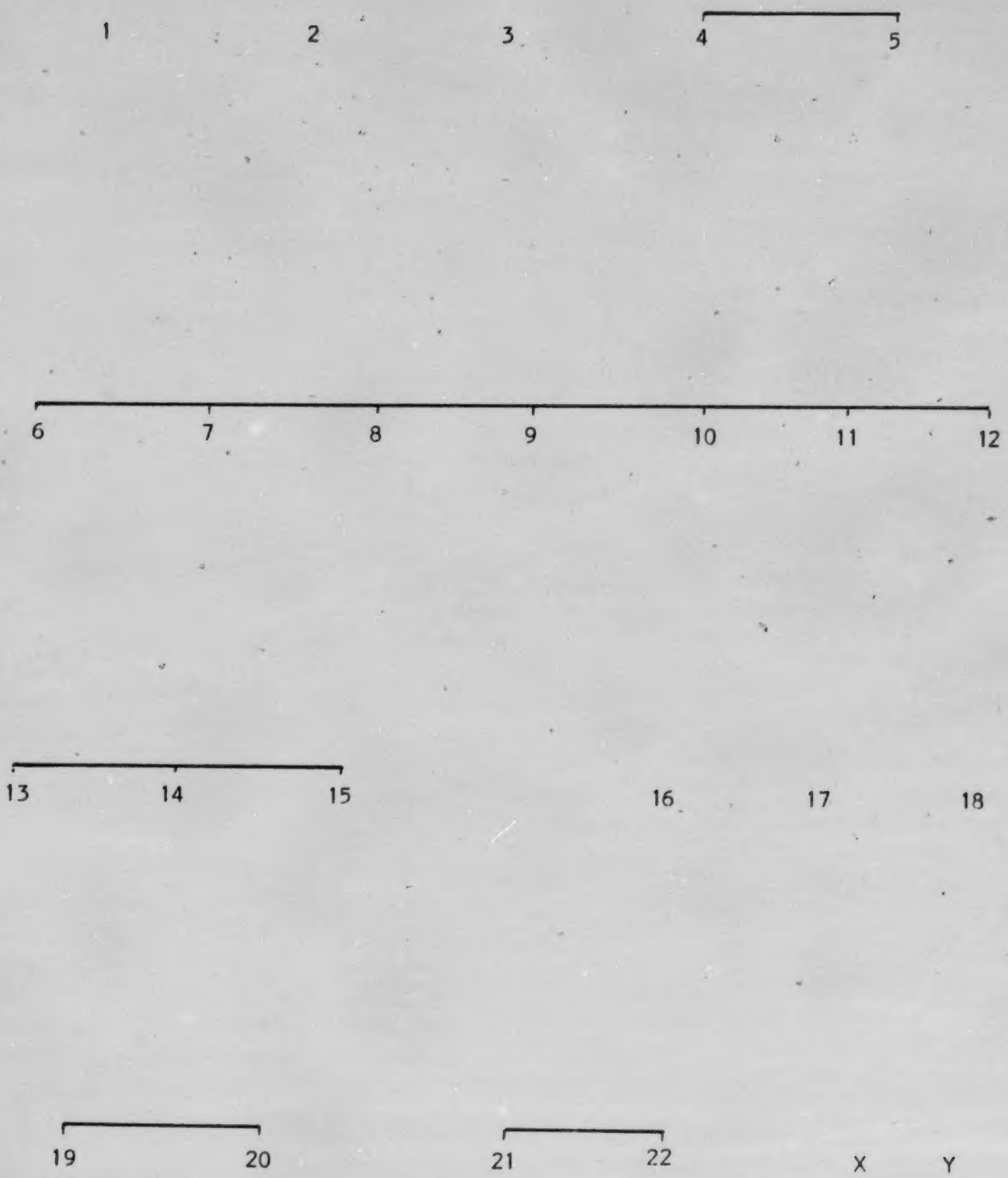
III. The Man and Woman
Ditto 27
A Karyotype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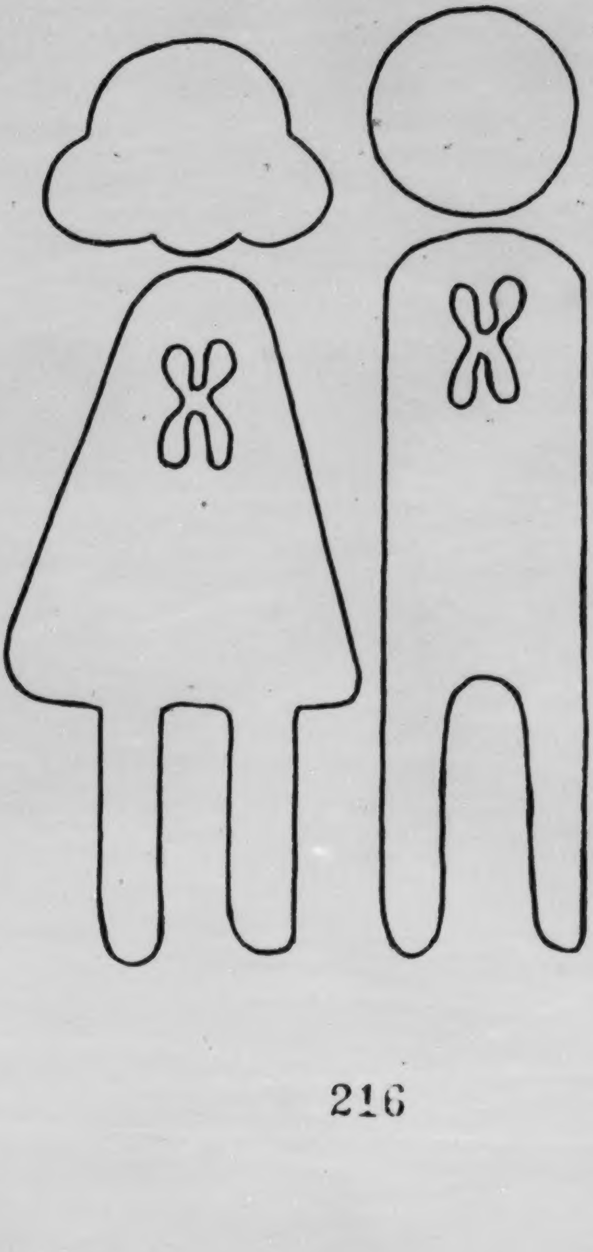
III. The Man and Woman

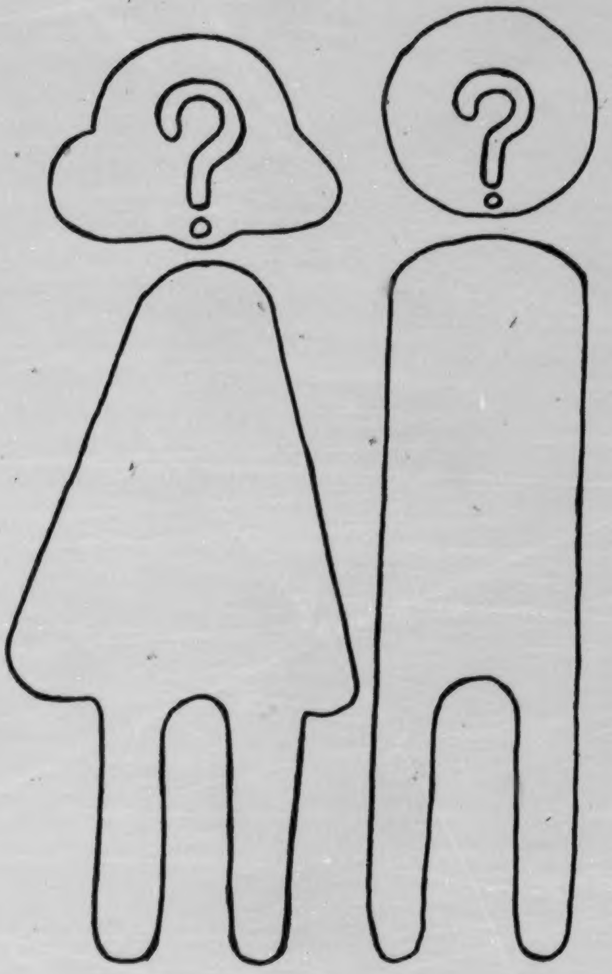
Transparency 23

Genetic Counseling



Transparency 24

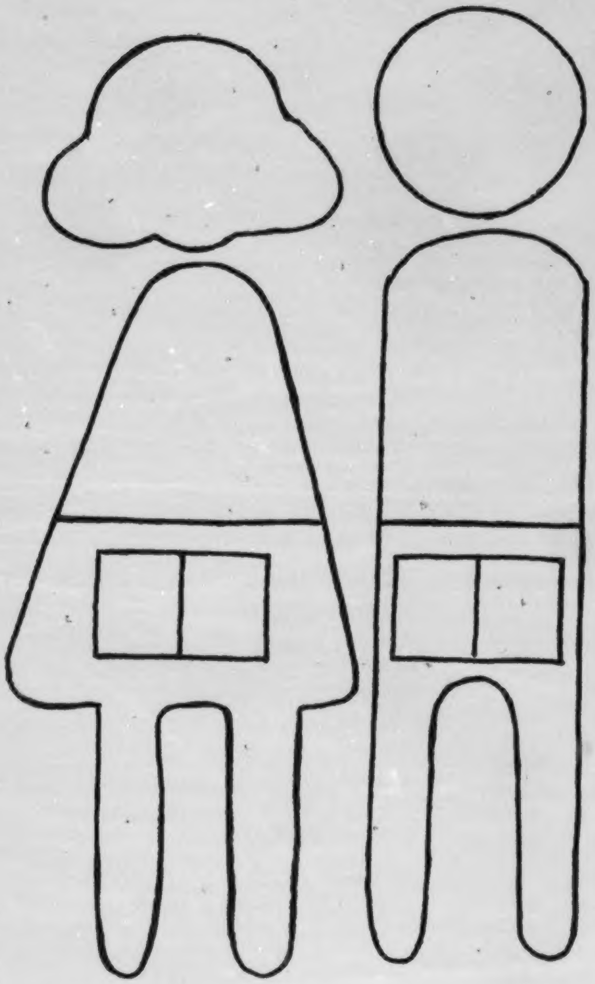
High Risk



III. The Man and Woman

Transparency 25

Genetic Counseling



III. The Man and Woman

Ditto 28

Genetic Counselor's Responses

GENETIC COUNSELOR I

A MAN OR WOMAN WHO CARRIES ONE OF ANY OF 60 DISTINCT DISORDERS OF METABOLISM ASSOCIATED WITH MENTAL RETARDATION CAN BE DETECTED.

219

III. The Man and Woman

Ditto 29

Genetic Counselor's Responses

GENETIC COUNSELOR 2

A MAN OR WOMAN IN WHOSE FAMILY A DOWN'S SYNDROME CHILD HAS BEEN BORN CAN PREVENT REOCCURRENCE IF THEY ARE A TRANSLOCATION CARRIER BY BEING TESTED AS A CARRIER.

220

III. The Man and Woman

Ditto 30

Genetic Counselor's Responses

GENETIC COUNSELOR 3

A FAMILY HISTORY OR PEDIGREE OF A MAN AND/OR WOMAN IS IMPORTANT IN DETERMINING X-LINKED GENETIC DEFECTS. CARRIER DETECTION IS AVAILABLE FOR AT LEAST FIVE X-LINKED DEFECTS AND IS IMPORTANT FOR WOMEN WITH AFFECTED MALES IN THEIR FAMILY.

III. The Man and Woman

Ditto 31

Genetic Counselor's Responses

GENETIC COUNSELOR 4

AT LEAST 6% OF BOTH AUTOSOME AND X-LINKED DEFECTS ARE PREVENTABLE.

222

III. The Man and Woman

Ditto 32

Genetic Counselor's Responses

GENETIC COUNSELOR 5

THE NUMBER OF DOWN'S SYNDROME CHILDREN BORN IN CAUCASIAN POPULATIONS COULD BE REDUCED BY 1/2 IF WOMEN STOPPED HAVING CHILDREN AFTER AGE 35.

223

III. The Man and Woman

Ditto 33

Genetic Counselor's Responses

GENETIC COUNSELOR 6

YOU SHOULD BE AWARE OF THE MENTAL RETARDATION SYNDROMES FOUND IN HIGH INCIDENCE IN YOUR PARTICULAR ETHNIC GROUP AND RECEIVE GENETIC COUNSELING REGARDING THESE SYNDROMES.

224

III. The Man and Woman

Ditto 34

Genetic Counselor's Responses

GENETIC COUNSELOR 7

A MARRIAGE BETWEEN FIRST OR SECOND COUSINS SHOULD BE AVOIDED BECAUSE DELETERIOUS GENES APPEAR MORE FREQUENTLY IN SUCH MARRIAGES.

III. The Man and Woman

Ditto 35

Genetic Counselor's Responses

GENETIC COUNSELOR 8

IF YOU ARE A CARRIER, YOU SHOULD BE CAUTIOUS IN MATE SELECTION OR CONSIDER ADOPTING OR LIMITING CHILDREN.

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III. The Man and Woman

Ditto 36

Genetic Counselor's Responses

GENETIC COUNSELOR 9

IF YOU CHOOSE TO HAVE A CHILD AND TAKE THE RISK AS A CARRIER, LET ME REFER YOU TO APPROPRIATE PROFESSIONALS IF THE CHILD IS BORN WITH A GENETIC DEFECT, SO THAT THE CHILD CAN HAVE OPTIMAL CARE AND DEVELOPMENT.

III. The Man and Woman

Ditto 37

Action Checklist

I want to:

____ Keep my own medical record. (Covering at least three generations if possible.)

____ Determine if I am genetically a high risk potential parent.

____ Receive genetic counseling before bearing children if I am potentially a high risk parent.

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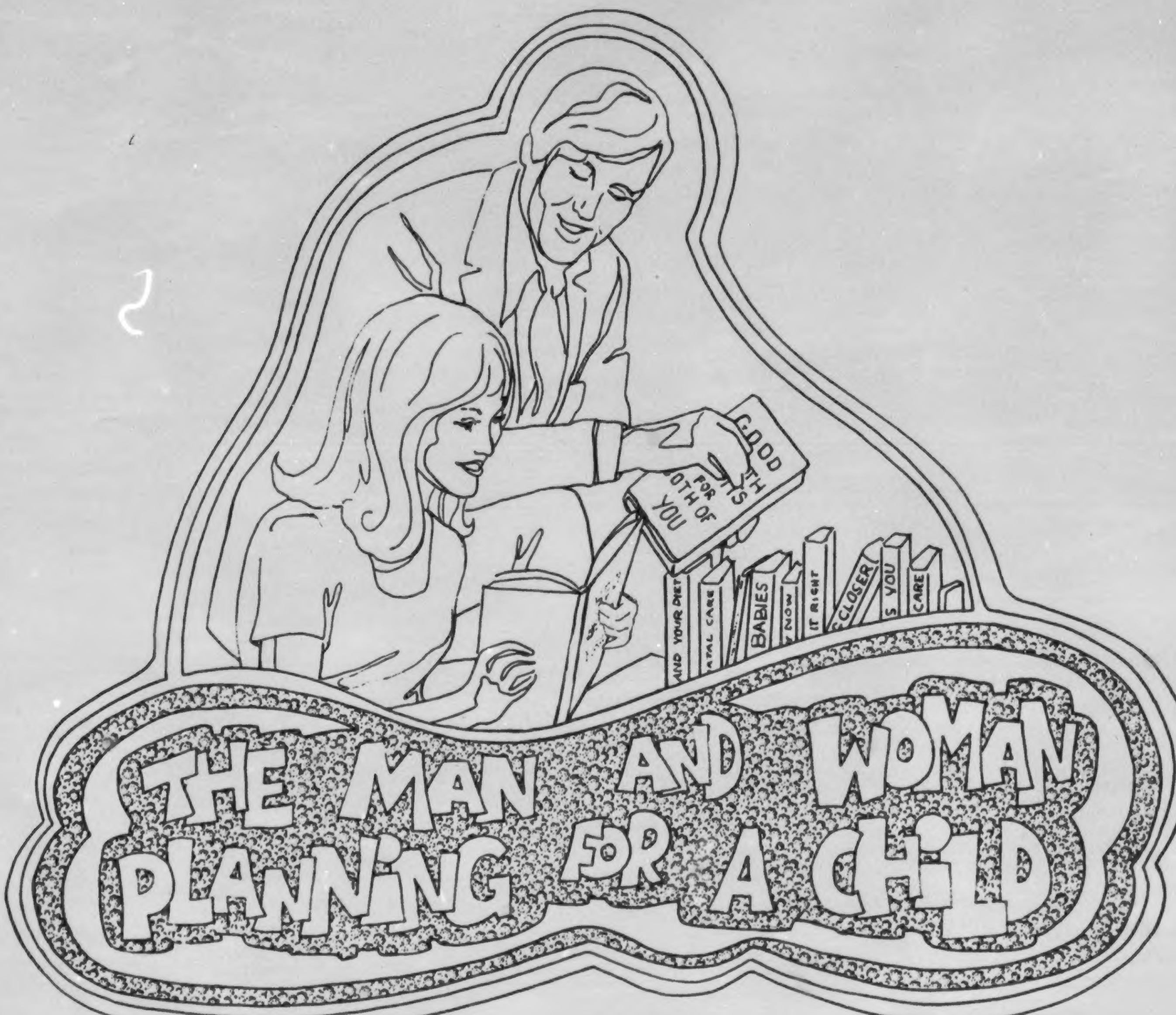
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CARE
THE MAN AND WOMAN
PLANNING FOR A CHILD

IV. The Man and Woman Planning for a Child

Their Responsibility Towards the Prevention of Mental Retardation in the Next Generation

Objectives

General

a. The student will understand that when a man and woman plan for a child it begins long before conception and pregnancy.
b. The student will realize that the medicine, drugs, alcohol and cigarette smoke taken into a pregnant woman's body go directly to the unborn baby.
c. The student will know that a number of medicines, drugs, alcohol and cigarette smoke taken in by a pregnant woman can cause mental retardation in the man and woman's unborn baby.
d. The student will realize that drugs, medicine, alcohol and smoke intake should be modified before conceiving a child.
e. The student will see the place where a man and woman are employed as a place to look for possible drug and chemical risks to them as potential parents and/or to an unborn child.
f. The student will realize that he or she must look at their own health, blood type and immunization when planning to bear a child.
g. The student will look at himself or herself as a possible "high risk" or "low risk" parent.
h. The student will be motivated to take his or her responsibility when planning for a child to prevent or lessen possible mental retardation in that child.

Specific

Cognitive

1. The student will be able to state why the unborn baby is not protected in the uterus from drugs the mother takes and infections and diseases the mother might have.
2. The student will be able to state three ways in which drugs can harm a growing unborn baby.
3. The student will be able to name two drugs which should not be taken when planning for a child.
4. The student will be able to explain how alcohol, smoking and some of the mind altering drugs can potentially cause mental retardation in an unborn child.
5. The student will be able to state two reasons why it is important to modify smoke, alcohol and drug consumption before becoming pregnant.
6. The student will be able to state why it is important for the father of the child to modify smoke, alcohol and drug consumption before fathering a child.
7. The student will be able to state five aspects of a potentially high risk parent.
8. The student will be able to name five tests a woman should have and three that a man should have while planning for a child.
9. The student will be able to list three types of work which could be potentially harmful for a man and woman planning for a child.
10. The student will be able to explain why it is important to space pregnancies at least two years apart.

Affective

1. The student will believe that when a man and woman plan for a child it must begin long before conception and pregnancy.
2. The student will feel that almost anything a pregnant woman takes goes to the baby with little "placental protection".
3. The student will strongly feel that drugs taken by the mother can cause mental retardation in the unborn child.
4. The student will be motivated to take action when planning for a child to:
    a. consider whether they are a "high or low risk" potential parent in relation to drugs, infection, disease and testing for infection and disease.
    b. (Girls only!) Modify drinking, drugs and smoking habits when planning for a child.
    c. (Boys only!) Modify drug and smoking habits when planning for a child for moral support and influence of the mother.
    d. Stop or modify intake of any drugs which are not absolutely for well-being when planning for a child.
    e. Be tested for infectious disease and unusual conditions.
    f. Check their own immunization record.
    g. Request a transfer if any chemicals or drug at their place of work which is potentially dangerous to them or their unborn child can be ingested or inhaled.
    h. Space pregnancies at least two years apart.

Background Information for the Teacher

RISK RATING

Sixty percent of "high risk newborns", that is newborns who are in jeopardy either physically or mentally, could be anticipated or predicted by identifying the actual or potential "high risk pregnancies". With appropriate measures:

1. The number of risky pregnancies can be reduced.
2. The baby at risk can be anticipated or planned for.
3. The risks within those pregnancies can be reduced.
4. The possibility for the physical and mental well-being of the infant will be improved.

... Everything that a man and woman are
... Everything that a man and woman eat
... Everything that a man and woman take
... Everything that a man and woman have
... Everything that a man and woman don't have
... Everywhere that a man and woman go
... Every treatment that a man and woman undergo
becomes or influences the child they are planning for.

The man and woman must take a good look at themselves.
... What is right and wrong with their bodies, their health?
... What surrounds them in their environment that may get into their bodies unintentionally?
... What are their bodies protected or not protected against?
... Are they ready to take the responsibility of the formation of another human being?

As a man and women look at themselves as potential parents, they must ask, "Do any of these high risk factors apply to me? Those risk factors underlined in the following chart are the concerns of Unit IV.

Various High Risk Factors for Parents Planning for a Child.

I. Preconception	II. Previous Pregnancies	III. Early Pregnancy	IV. Late Pregnancy	V. Labor and Development	VI. Newborn
Family genetic, or central nervous system disorders	Infant with a genetic disorder	* COLUMN I COULD BE HERE FOR A MAN AND WOMAN WHO DO NOT PLAN FOR A CHILD*	Unwanted	Premature labor	Less than 35 week gestation
Intermarrying	Infant with a birth defect		Uterine bleeding	Induction of labor	Birthweight less than 2,000 grams
Low socio-economic status	Premature or small for birth infant		Toxemia	Obstruction of birth canal	Respiratory distress
Excessive radiation exposure	Excessively large infant		Excessive amnionic fluid	Fetus and pelvic disproportion	Seizures
Nutritional abnormality	Caesarean section		Obstruction caused by a clot	Fetal distress	Infection
Under 15 or over 40	Difficult childbirth		Growth too small or large for date	Poor progress in labor	Congenital defects
Incompetent cervix	Stillbirth or newborn death		Abnormal position	Abnormal position for birth	Vomiting of elimination swallowed before birth
Abnormal genital tract	Abortion or abortions		Past due	Abnormal bleeding	Excess acid accumulation or loss of bases
High blood pressure	Special care needed for newborn		Rupture of membrane for more than 12 hours without labor	Operative delivery	Elevated blood sugar
Under or over-active thyroid	Severe emotional problems during pregnancy and delivery		Evidence of infection	Infection of the placenta	Elevated breakdown products or red blood cells
Heart disease	Excessive vomiting			Mis-positioning of the placenta	
Kidney disease				Tissue in the amnionic fluid	

Various High Risk Factors for Parents Planning for a Child. (continued)

I. Preconception	II. Previous Pregnancies	III. Early Pregnancy	IV. Late Pregnancy	V. Labor and Development	VI. Newborn
Diabetes					Lack of oxygen
Cancer					Rh disease
Anemia					
Rh incompatibility					
Exposure to harmful drugs or chemicals					
Harmful drug intake					
Lack of rubella immunization					
Syphilis					
Tuberculosis					
Hepatitis					
PKU mother					
Children closely spaced					

In accepting a philosophy and taking action on it, a man and woman planning for a child can keep many of the risk factors listed under "preconception" out of the column "early pregnancy". In other words, these risk factors can be eliminated or brought under control before a man and woman create a child. Such action may also eliminate or lessen some of the risk factors listed under late pregnancy, labor and delivery and the newborn; such things as prematurity, small for gestational age, infection, congenital defects, Rh disease and elevated blood sugar.

Let's start out with why the man and woman must look at what they are, where they go, what they take, what they have and don't have and what treatment they are undergoing to reduce these risk factors.

Nature in her lavish plan to populate the earth, devised a process that has a successful outcome the majority of the time. We are kind of "lulled" into a false sense of security and apathy by this miraculous process. Historically, we have seen the unborn child as being snugly protected and insulated by the mother...impervious to all outside influence. It has not been until relatively recently that the unborn child has revealed itself as a very vulnerable human being with fantastic contact with the outside world.

It used to be thought that the placenta, the tissue that serves as a transport system for food and wastes between the mother and the unborn child was a barrier that protected the baby from dangerous substances and helped make the womb a safe and cozy place. Actually the placenta may magnify the concentration of substances flowing from the outside world -- to the mother -- to the child. Substances travel to the unborn child by slow and rapid diffusion and a leakage and drinking process through the red blood cells. Drugs that have a molecular weight of 1000 or less can usually cross the placenta. Those of a molecular weight of more than 1000 cannot. Many substances which do not ordinarily pass through the placenta can do so easily in the presence of Toxemia, a condition common in pregnancy, which is characterized by excess fluid accumulation and high blood pressure. Toxemia is of higher incidence in teenage pregnancies and those of diabetics. Most every drug given to the mother by any route can be found in the fetus as soon as the placenta is established.

Because so many pregnancies occur without planning and because the hazards of taking drugs are greatest in early pregnancy, no woman who thinks there is any possibility that she could be pregnant or might become pregnant should take drugs unless prescribed by a doctor who really considers the "possibility of pregnancy."

"A TERATOGEN, -- A WHAT!?"

A TERATOGEN IS A DRUG OR OTHER AGENT THAT CAUSES DEFECTIVE DEVELOPMENT BEFORE BIRTH. A big word, easy concept, big implications.

... Less than 3% of birth defects are known to be due to teratogens. The unknown could undoubtedly boost that much bigger.
... 600 drugs or chemicals produce congenital defects in experimental animals.
... There are 20 drugs or chemicals that are known to cause human defects.
... 2,000 new chemicals are introduced into the environment each year.

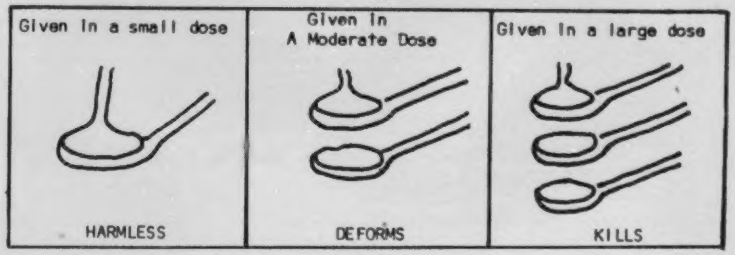
We know little about the effects of chemicals around us on our own bodies. The public is just awakening to the fact that chemicals do effect them. We know even less about their effects on the unborn child. Often a link between a chemical and a birth injury is removed by a generation and thus is very hard to pin down. The National Institute for Occupation and Safety Hazards Director admits that "Chemicals are regulated but not with the protection of women of childbearing ages in mind."

While animal studies can't be equated with studies on humans, we should take caution from such studies when they are all we have. We have also learned that animals often are far less susceptible to the mutilating effects of drugs and chemicals. In point: Thalidomide, the drug taken by pregnant women in the 1960's which devastated 10,000 unborn babies, leaving them with seal-like limbs, had been tested on animals. Thalidomide left obvious clues, other drugs may injure and hide their secrets for years. Drugs can cause

- malformations
- endoctrine disorders
- toxic effects
- abnormal growth
- reduce oxygen to the fetus
- reduce food to the fetus
- a change in how penetrable the placenta is

As the unborn child grows from a cell to some 15,000,000,000 cells, there is not only an infinite amount of variability within that organism but also specific periods during which any organ is potentially vulnerable to the effects of a potentially harmful drug. Other variables are illustrated in Figure 33.

Figure 33. The Variables that effect whether or not a potentially harmful drug or chemical will damage an unborn child.


Given in a small dose
Given in A Moderate Dose
Given in a large dose
HARMLESS
DEFORMS
KILLS

Other factors effecting how a drug will effect the developing cells are:

- The genetic make-up of the unborn child
- The second, minute, hour, day, week or month of pregnancy that a drug is taken
- The health of the mother
- The nutrition of the mother

Some of the factors above most probably came into play in the Thalidomide story ... 10,000 infants were born deformed, while 80% of the infants born to women taking Thalidomide were born "normal."

The use of unnecessary drugs should be stopped or modified before pregnancy.

THE HARMFUL SOCIAL DRUGS

Since the 50's, we have known that babies born to mothers who smoke are on the average, 1/2 pound smaller than those born to mothers who do not smoke. The more cigarettes mothers smoke, the less the baby is apt to weigh. They are also more likely to

- be shorter
- be retarded in growth
- be retarded in development
- be stillborn
- die in the first 10 days after birth
- have constricted blood circulation
- have possible intellectual impairment
- have more severe vomiting

Nicotine, carbon monoxide and cyanide are all found in cigarette smoke. One third of all pregnant women are passing these chemicals on to the developing child for this is the number who smoke while pregnant.

- Smoking decreases the appetite of the mother.
- The carbon monoxide has a greater affinity for hemoglobin (The oxygen carrying component of the blood) than oxygen, so in its competition starves the red blood cells for oxygen.
- Smoking impairs the infant's heart rate, blood pressure, oxygen supply and acid balance.
- The cyanide effects fetal growth by acting on the B vitamin (B12) metabolism of the mother and baby.

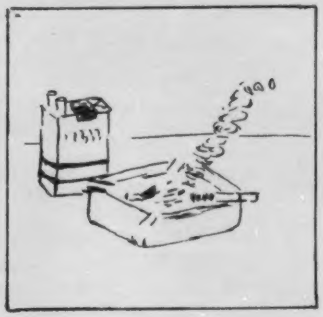
Factors which have been successful in influencing women to stop smoking during pregnancy are:

1. Their total acceptance of the threat to the developing child.
2. Their acceptance of cigarettes as a drug.
3. The pressure and support of husbands, mothers and society in general, encouraging the pregnant woman not to smoke during pregnancy. One third of women feel that it is socially unacceptable to smoke during pregnancy.
4. If they have cut down on cigarettes before pregnancy.
5. If they stopped smoking on previous occasions for six months or more.
6. If they had heard about the dangers of smoking while pregnant from a variety of sources.
7. If they had not had a previous pregnancy. The absence of apparent ill effects in previous pregnancies cuts down on credibility.

If a woman cannot stop smoking while she is planning for a child, she should at least try to:

1. Stop before the 4th month of pregnancy.
2. Not inhale.
3. Reduce the number of cigarettes she smokes.

It is also very supportive if a man encourages modification in smoking or acts as a model in giving up or reducing smoking, thus taking part in trying to protect his unborn child by influencing the mother.



There are one million alcoholics of childbearing age and the numbers are growing, particularly among teenagers. If a woman drinks, she should not become pregnant. If she becomes pregnant, she should not drink. The unborn child is effected two times as fast as the mother is by her alcohol consumption and the same concentration.

The "alcohol myth" may be added to the protected unborn child myth. It has been a long held belief that alcohol has no effect on the unborn child. Surprisingly, Greek and Roman literature spoke of deformation of human growth by maternal alcohol consumption. Also in the 1800's, numerous scientists recognized retardation in both human and animal species growing in the presence of maternal alcoholism. Little attention was paid to this fact until 1973, when a Fetal Alcohol Syndrome (FAS) was described and confirmed by other studies. Alcohol may be the third largest cause of mental retardation. Forty to fifty percent of infants born to mothers who are chronic alcoholics (three average size drinks per day) or mothers who go on binges, are born mentally retarded with various physical defects. There are many cases in which part of the syndrome may be found and some in which there may only be a single malformation. Figure 34 summarizes the Fetal Alcohol Syndrome characteristics.

Figure 34. Fetal Alcohol Syndrome Characteristics.

Growth and Development	Growth failure before birth Growth failure after birth Skull that is too small for the brain Small in length compared to weight
Eyes	Lesions in the eyelids Fold of the skin in the corner of the eye Perceptual problems Narrow eyes
Face	Low nasal bridge Short upturned nose Outer ear deformity Underdevelopment of the jaw
Other	Heart defects Hip dislocation Skeletal defects Decrease in joint mobility Motor development delay Abnormal creases in the palm of the hand Female genital defects
Behavior	Jittery Hyperactive Weak grasp - poor coordination Poor sucking Irregular sleeping Self stimulator
Intellectual	Mentally retarded: borderline to moderate

It is not known how long or how much alcohol is necessary for the production of all or part of the fetal alcohol syndrome. It is thought that the fetus is susceptible for most of the nine months of growth.

The FAS infant has alcohol on its breath and must be weaned from alcohol over a two week period. Such an infant has the same withdrawal symptoms as an adult.

The mind-altering drugs and their effect upon the unborn child are summarized in Figure 35 . While research does not provide conclusive evidence as to fetal abnormality caused by the mind-altering drugs, it does suggest an association. How dangerous the effect and how and when it may show up after birth we don't yet know.

Figure 35. The effect of mind-altering drugs on the development of the unborn child.

DRUG	EFFECTS ON THE UNBORN CHILD
Heroin and Morphine	Irritable Sleeps poorly High pitched cry Vomiting and diarrhea Marked physiological withdrawal symptoms Decreased oxygen in the blood and tissues May have hepatitis from unclean needle Susceptible to infection Complications in 40% of addicted: 1. toxemia 2. breach birth 3. prematurity 4. small for date of birth 5. premature separation of the placenta Complications if not treated: 1. dehydration 2. respiratory distress 3. shock 4. coma 5. mineral imbalance
Amphetamines and Barbiturates	Miscarriage Birth defects
Tranquilizers	Such drugs as Sominex, Nytol, Sleep-Eze and Compoz contain two antihistamines which have produced congenital deformities in animals.
LSD (Lysergic Acid Diethylamide)	MAY cause chromosome damage. SOMETIMES contaminated with quinine or other materials which may harm the unborn child. A few surveys have found a higher incidence of congenital defects in children of LSD users.

Since 1960, millions of women have relied on birth control pills to prevent pregnancy. If they are taken during the early months of pregnancy they can produce heart and limb abnormalities. The use of the pill should be timed so that it is not being used "well before a man and woman conceive a child."

THE NECESSARY DRUGS

Any chronic maternal illness or condition demands special attention for three reasons:

1. Carrying both a disease or condition and a baby makes good medical care of the mother important.
2. A baby growing in the mother who has a disease or special condition may have special needs and should have good medical care.
3. A mother with an illness or special condition may be taking special medication and this medication may have to be modified to protect the unborn child.

Let's look at some examples of maternal conditions that put the mother at risk.

1. HYPERTENSION.
   High blood pressure resulting from genetic, heart or kidney problems treated with RESERPINE near delivery causes the newborn to choke and gasp with nasal congestion.

2. An UNDERACTIVE OR OVERACTIVE THYROID.
The infant of a mother with a lowered thyroid function may be born with a lowered thyroid function resulting in Cretinism. Cretinism is preventable by careful management of the mother's nutrition and thyroid supplements. A mother with either an under or overactive thyroid is at greater risk of having children with chromosomal abnormalities.

Thyroid studies or therapy utilizing the radio-isotope I131 should not be used during pregnancy. THIOURACILS, IODIDES and/or RADIOACTIVE IODINE will cause thyroid abnormalities and damage or abnormalities of the thyroid of the unborn child.

3. DIABETES.
Diabetes is a chronic chemical imbalance which prevents the body from using sugar and other carbohydrates properly because they have an inadequate production of insulin. Women with Diabetes should have the services of a good obstetrician. The woman and man should plan pregnancies at a time when the mother's disease is "at its best". The risk to infants of diabetic mothers is so severe that one out of every four babies die in the womb if the mother is not under excellent medical care. The amounts of sugar needed by the unborn child often change drastically during pregnancy and the unborn child depends on the mother for his or her sugar. Complications for an unborn child of a diabetic can be:

a. Excessive growth before birth (20% of these babies are over 10 pounds) can make diabetic babies vulnerable to brain damage in the birth process.
b. Excessive growth may call for premature delivery by Caesarean Section.
c. A higher incidence of heart and skeletal defects.
d. Severe lung and breathing problems.
e. Jaundice.
f. Low blood sugar.
g. Convulsions.
h. Brain underdevelopment.

All of these things can result from the high blood pressure, toxemia and excessive or insufficient insulin in a mother who has inadequate or no obstetrical care. Insulin, rather than oral diabetic drugs, should be considered since the oral form is associated with higher complication rates.

5. CANCER.
A woman with cancer is at risk when chemotherapy is being used to decrease the rate of cell growth in her malignant tissue. It is a threat to the rapidly developing infant cells, particularly during the first three months. AMINOPTERIN as well as numerous other chemotherapy drugs are definitely harmful to the fetus.

6. MENSTRUAL CYCLE ABNORMALITY.
Progestrone is used to correct abnormalities of the menstrual cycle and also to prevent miscarriages although rather ineffectively.

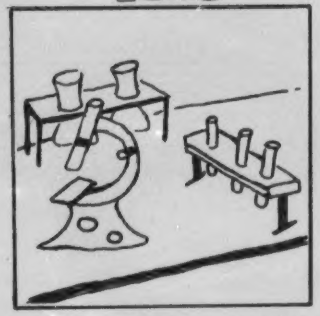
Progesterones should not be used by a woman planning for a child. It is a definite teratogen which can cause gross malformations and masculinization of the sex organs of the female infant.

7. ALLERGY or a COLD.
Antihistimines with brand names such as BENADRYL, PHENEGRANAND ANTIVERT have been implicated in causing various deformities in experimental animals. A woman planning for a child should not use antihistimines.

8. EPILEPSY.
Seizures caused by abnormal bursts of electrical activity that come from within the brain range from mild lapses of memory to loss of consciousness and convulsive shaking. DILANTIN and PHENOBARBITAL are the most common drugs given for seizure control. Birth defects are more common in unborn children exposed to these drugs. They have a 3 to 4 times greater chance of having birth defects than in pregnant women not taking these drugs. TRIDIONE and DILANTIN can both cause cleft palate and various malformations. The woman planning for a child who has seizures and is on medication should:

1. Not take the drug automatically.
2. Have a medical evaluation to see if the drug is really needed.
3. Modify dosage and type of medication under medical direction.

TESTS



There are a number of tests which should be done just as a matter of routine when a man and woman are planning for a child. These tests assure the man and woman that they are not carrying an infection, disease or incompatibility that would be harmful to the developing fetus. Figure 36 summarizes these tests.

Figure 36. Tests which should be done routinely when a man and woman are planning for a child.

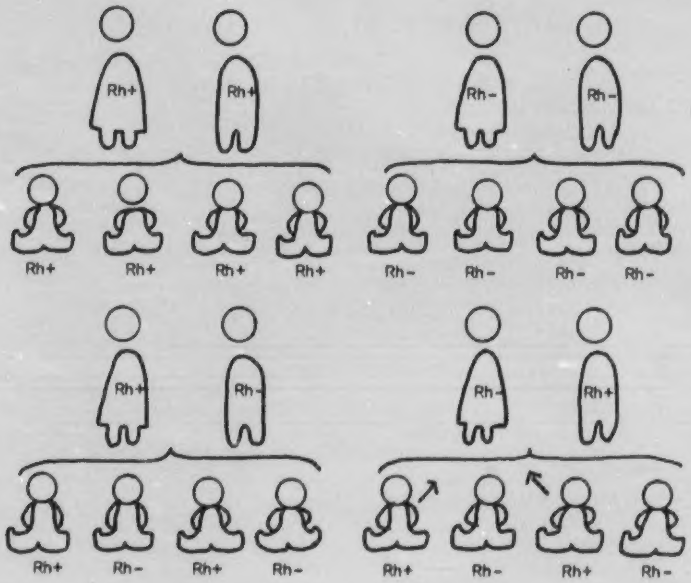
Test for:	Because
Maternal PKU	Any woman whose cause of mental retardation is unknown should be checked for this possibility. A woman with PKU who is unaffected by it herself can give birth to a child with extensive brain damage because of the high concentration of phenylalanine in her blood.
Rubella	If antibodies are not present, the woman should be immunized at least three months before becoming pregnant.
Venereal Disease	Venereal disease should be treated for both the man and woman before they form a child
Tuberculosis	T.B. can cause central nervous system problems in an infant. Also STREPTOMYCIN, used in T.B. treatment can cause deafness in the unborn child. T.B. should be arrested before a woman becomes pregnant.
Rh Factor	A woman should know if she carries antibodies which destroy red blood cells of an unborn child causing mental retardation, anemia, seizures, cerebral palsy, deafness and stillbirth.

The Rh Factor Explored

The Rh factor refers to a special protein found in the surface makeup of the red blood cells of some people (Rh+) and not on others (Rh-). Its presence or absence has no particular health or physical significance for the man and woman.

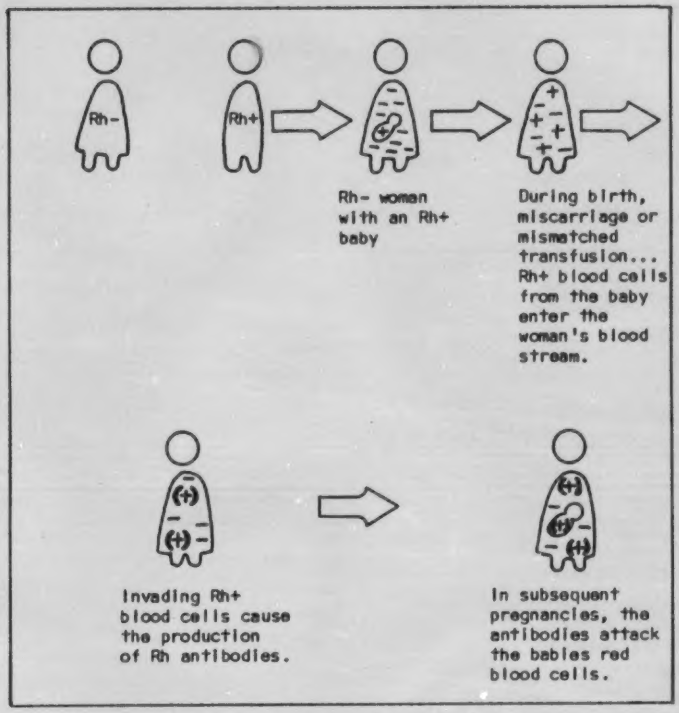
One in six women are Rh-. Five in six are Rh+. Two genetic components determine which type a child will become. Figure 37 illustrates these possibilities.

Figure 37. Four possibilities of Rh inheritance for the child.



Only when the woman is Rh- and the man Rh+ and the woman subsequently carries an Rh+ baby, does Rh incompatibility develop. All other combinations will not present a problem. Figure 38 illustrates how hemolytic or Rh disease develops.

Figure 38. How Rh Disease Develops.



Rh- woman with an Rh+ baby

During birth, miscarriage or mismatched transfusion... Rh+ blood cells from the baby enter the woman's blood stream.

Invading Rh+ blood cells cause the production of Rh antibodies.

In subsequent pregnancies, the antibodies attack the babies red blood cells.

As the antibodies attack the red blood cells, a breakdown product is bilirubin, a pigment in the red blood cells. These waste materials result in a yellow color which is called jaundice for the immature liver cannot process these waste products quickly enough. When these wastes are present in large amounts, they become deposited in the brain, which interferes with the ability of brain cells to utilize oxygen. They become starved for oxygen and die.

There is a 13% risk of the mother developing antibodies in the first pregnancy and an added 13% risk with each subsequent pregnancy, so the chances of hemolytic disease in subsequent pregnancies is greatly increased.

Hemolytic disease is almost entirely preventable. In the 1940's and 50's, there was a 40% drop in the infant death rate from hemolytic disease by:

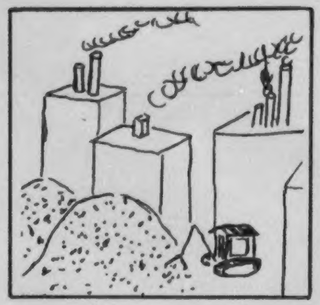
1. A standard blood transfusion replacement after a baby was born.
2. Inducing labor so that there would not be an antibody buildup in the baby.
3. Giving the baby a transfusion while still in the uterus.

These methods must still be used for women who gave birth before the 60's for they have already built up Rh antibodies. In the late 60's, a vaccine was developed to desensitize mothers so that they would not create antibodies against the Rh+ red blood cells. The mother is injected within 72 hours after each birth, miscarriage or mismatched transfusion. Immunoglobulin destroys the Rh+ red blood cells that have leaked into the mother's bloodstream so that she does not produce antibodies against the Rh+ red blood cells.

Some interesting facts:

... In 1968 Immunoglobulin was developed.
... Prior to 1972, up to 10,000 babies a year were stillborn due to Rh blood disease. Another 20,000 were left mentally retarded, cerebral palsied, deaf, blind and/or epileptic.
... In 1972, 20,000 babies were born with Rh disease, another 5,000 ended in stillbirths.
... In 1974, 7,000 babies were born with Rh disease.
... By 1974
  - only 5 states fully monitored Rh disease
  - only 7 states required premarital or pregnancy blood typing
  - only 6 states had made progress in reporting Immunoglobulin utilization.
... In 1974 80% of the 449,100 women estimated to need the Immunoglobulin serum were receiving it, leaving about 91,300 women at risk.
... In the U.S., 12,000 women each year are added to the group of over 250,000 who are in the childbearing years and have developed antibodies - putting subsequent children at risk.
... Caucasians carry a higher risk for
  15% of Caucasians are Rh-
  7% of Negroes are Rh-
  7% of Jews are Rh-
  1% of Orientals are Rh-.

Rh type should be considered an essential component of every person's personal health knowledge.



CHEMICALS AND DRUGS AT WORK

Certain jobs can be dangerous to the health of both the man and woman and an unborn child. The Occupational Safety and Health Administration (OSHA) has the job of creating and policing health and safety standards at places of employment. OSHA estimates that more than one million women of childbearing age could be working in hazardous environments. However, the director of OSHA says that chemicals are regulated, but not with the protection of women of childbearing ages in mind. OSHA has identified 20 chemicals tha+ produce or are suspected of producing birth defects. Figure 39 summarizes some chemicals that are dangerous to either the unborn child or the man and woman planning for a child.

Figure 39. Examples of Job Related Teratogen.

Chemical	Type of Job With Possible Risk
Benzene Tolvene Organic Solvents	Paint and Cleaning Agent Industry Paint Industry Motor Industry
Organic Dyes	Fabric Industry
Vinyl Chloride	Plastics Industry
Mercury	Insecticide Inuustry Fungicide Industry
Halothane	Operating Room Personnel
Carbon Monoxide Lead	Traffic Police Personnel Parking Lot Attendants Toll Booth Workers
Thallium Cadmium Arsenic	Mining Motor Industry Smelting Industry Chemical Warfare Industry

THE MAD HATTER

An Example

In Victorian England the term "mad as a hatter" arose to describe the behavior of individuals exposed to mercury fumes in the felt hat industry. Today mercury has over 2,000 industrial uses. It has widespread use in the insecticide and fungicide industry. As mercury enters lakes and rivers as industrial wastes, bacteria in the water convert one form of the metal into another deadly form, methyl mercury, which can be ingested or inhaled. In 1969, such industrial waste was poured into Minamata Bay and the tragedy of children born to Japanese women who habitually ate shellfish from the polluted waters during pregnancy could be seen in physical deformities, tumors, cerebral palsy and mental retardation. Mercury is a cumulative poison, and as such, each new source can remain in the environment anywhere from 10 to 100 years. It inhibits normal cell growth and functioning and causes chromosome damage.

The man and woman planning for a child who are employed in a place where chemicals of any kind are used should look up those chemicals in several sources.

1. Toxic and Hazardous Industrial Chemicals Safety Manual for Handling and Disposal with Toxicity and Hazard Data. International Technical Information Institute, Japan 1975.
2. Stellman, J.M., and S.M. Daum, Work is Dangerous to your Health: A Handbook of Health Hazards in the Workplace and What You Can Do About Them. Pantheon Books, New York, 1973.
3. Sac, I.N., Dangerous Properties of Industrial Materials, Litton Educational Publishing, New York, 1975.
4. U.S. Department of HEW, Occupational Diseases: A Guide to Their Recognition, W.M. Gafafer, Ed., PHS Pub. No. 1097, Government Printing Office, Washington, D.C., 1966.

If these sources seem overwhelming, a man or woman can just write to:

Occupational Safety Health Administration
Department of Labor
Information Services
200 Constitution Ave., N.W.
Washington, D.C.
Telephone 202 523-8148

Now that the man and woman have reduced their risks in planning for pregnancy, two do's and one don't surround the process of conceiving a child.

The man and woman should:

1. Space pregnancies at least two years apart. The shorter the time between pregnancies, the more likelihood there will be birth defects and obstetrical complications.
2. Plan for fertilization of a fresh egg with fresh sperm. Intercourse during the time when conception is possible is thought to increase the possibility that neither the egg or sperm will be starting to disintegrate when they join.

The Woman Should Not

1. Take pregnancy testing pills. (Amenorone Forte or Primolos). Both of these are associated with central nervous system defects.

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Pretest

Cognitive

1. Drugs can harm the unborn child by causing
   - ____ a. malformation
   - ____ b. gland disorders
   - ____ c. both of the above.

2. Drugs _____ cross the placenta to damage the unborn baby.
   - ____ a. never
   - ____ b. most of the time
   - ____ c. always

3. Infectious diseases which the mother might have which may cause disease in the unborn child or mental retardation are
   - ____ a. syphilis
   - ____ b. rubella
   - ____ c. both of the above.

4. A mother who's blood is _____ must be concerned with the blood type of the father.
   - ____ a. Rh-
   - ____ b. Rh+
   - ____ c. neither of the above

5. Immunization against rubella may be done _____ pregnancy to protect the unborn baby from possible infection.
   - ____ a. at least 3 months before
   - ____ b. at least 3 months after
   - ____ c. neither of the above

6. An interval of at least ____ years should be allowed between pregnancies to decrease the likelihood of birth defects and obstetrical difficulties.
   - ____ a. 5
   - ____ b. 4
   - ____ c. 2

7. A "high risk" mother may be one who has
   - ____ a. diabetes or high blood pressure
   - ____ b. anemia or drug addiction
   - ____ c. all of the above.

8. If you are in a job where lead or mercury can be inhaled or injested, you should request a transfer
   - ____ a. before you conceive a child
   - ____ b. during pregnancy
   - ____ c. after the child is born.

9 Diseases and disorders in the mother must be carefully planned for in pregnancy because
   - ____ a. of the drugs she is likely to be taking for the disease or disorder
   - ____ b. good prenatal care will be necessary
   - ____ c. both of the above.

10. Smoking causes babies to be born that are
   - ____ a. too large for birth
   - ____ b. too small for birth
   - ____ c. just the right weight for birth.

11. Chronic drinking or going on binges when carrying an unborn child causes mental retardation in the newborn ____ of the time.
   - ____ a. 20%
   - ____ b. 40%
   - ____ c. 70%

12. "The Pill" should not be taken _____ a woman becomes pregnant for it can cause heart disease and limb abnormalities in the unborn child.
   - ____ a. one week after
   - ____ b. one month after
   - ____ c. well before

Key: 1.c, 2.b, 3.c, 4.a, 5.a, 6.c, 7.c, 8.a, 9.c, 10.b, 11.b, 12.c.

Affective

Circle the word or words that best describe the intensity of your feelings.

1. I feel that a man and woman must plan for a child long before that child is conceived.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

2. I feel that the unborn baby is easily effected by the drugs, alcohol and smoke that a mother takes into her body.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

3. I feel that some drugs taken by the mother can cause mental retardation in the unborn child.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

4. I feel that the father of the child has a responsibility in influencing the smoking, drinking and drug habits of the mother.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

5. I feel that if I were planning for a child, I would want to:
   a. Consider whether I am a "high or low risk" potential parent in relation to drugs, infection, disease and testing for infection and disease.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

   b. (Girls only!) Modify drinking, drug and smoking habits when planning for a child.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

   c. (Boys only!) Modify drug and smoking habits when planning for a child for moral support and influence of the mother.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

   d. Stop or modify intake of any drugs which are not absolutely for well-being when planning for a child.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

   e. Be tested for infectious disease and unusual conditions.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

   f. Check my own immunization record.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

   g. Request a transfer if any chemicals or drugs at my place of work are potentially dangerous to me or an unborn child if inhaled or ingested.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

   h. Space pregnancies at least 2 years apart.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

Mini Lecture or Presentation

"Getting Ready for the Nine Month Run"

... Everything that a man and woman are
... Everywhere that a man and woman go
... Everything that a man and woman take
... Everything that a man and woman eat
... Everything that a man and woman have
... Every treatment that a man and woman undergo

... Becomes part of the environment of the unborn child they are planning for. For hundreds of thousands of years, we have seen the unborn child as safe, sound and snugly protected from all of the "evils" of the outside world and even his parents. It wouldn't be until birth that the child would come under the influences of the outside world. Inside the womb, he was considered impervious to all that went on around him by the protection of the "placental barrier". We now know that "the placental barrier is a myth", and that the unborn infant has fantastic contact with the outside world. The myth has been broken because:

... the baby receives substances in the same concentration in which the mother takes them into her body.
... the placenta may actually magnify the concentration of substances flowing from the mother to the child.
... the molecules of drugs and chemicals which are stopped by the placenta must be very large.
... if the mother has high blood pressure, substances which ordinarily could not pass thru the placenta can do so.
... most every drug given to or taken by the mother can be found in the unborn baby.

The man and woman planning for a child are something like an athlete planning for a race. The runner must take a good look at himself before he feels that he is ready for the competition.

- If he has a disease he is probably not ready.
- If he has an infection he is probably not ready.
- If he has drugs in his body that work against him, he is probably not ready.
- If he must run in a lousy environment, he is not ready.
- If he has just run a marathon he will not immediately be ready for another one.

After the runner has taken a look at himself, he decides whether or not it is too risky for him to run in "this race". Perhaps he had better wait until he and his environment are in better condition for right now he has a 60% chance of losing the race. So it is with a man and woman. If all men and women would PLAN for childbearing, they could evaluate the risks that they bring to this

"Nine Month Race"

and work to eliminate or modify those risks before they got to the starting line. They would then be ready for the physical and psychological demands of forming a new person all the way from one cell at the starting line to 15,000,000 cells at the finish line and birth.

By using a "Risk Rater" let's look at ourselves as having certain risks that we might bring to childbearing.

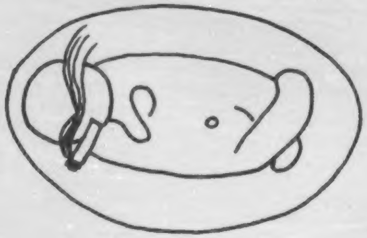
STUDENT INVOLVEMENT:
See how each of you would rate to start the race. The "Risk Rater" is for your own personal use. Please respect the privacy of others. Pass out the "Risk Rater" to each student. (Prepared from Ditto 38).

The Risk Rater	
Smoking Drinking Drugs The Pill TOTAL ________	High Blood Pressure Underactive Thyroid Overactive Thyroid Diabetes Cancer Menstrual Cycle Abnormality Allergies Seizures TOTAL ________
Rh Factor Rubella Immunization **Venereal Disease** Tuberculosis PKU (Girls only) TOTAL ________	Work in which harmful chemicals are used Work in which harmful drugs are used **Work in automobile exhaust** TOTAL ________

Many of the risks on the rater are factors that we must change before we bear a child for it is either past the critical first month of development when pregnancy is an absolutely known fact or else we need more time to get rid of or modify some of the "risk factors" that are part of us.

"The Social Drugs"

Question: Would you give an unborn child a cigarette to smoke to pass away his hours of waiting to be born? (Use transparency 26 for a symbolic representation of this question.) Wait for reactions whether serious or light!



Ridiculous!? Not as ridiculous as it looks! One third of all pregnant women are doing just that.

We know that babies born to mothers who smoke are more likely to
- be shorter
- be retarded in growth
- be stillborn
- die in the first ten days after birth
- have constricted blood circulation
- have possible intellectual impairment
- have more severe vomiting

The smoking pregnant woman passes on nicotine, carbon monoxide and cyanide to the cells of the developing child.

* Carbon monoxide has a greater affinity for the hemoglobin (the oxygen carrying component of blood) than does oxygen and thus pushes its way in to be carried by the hemoglobin in place of oxygen. The heart rate, blood pressure, oxygen supply and acid balance of the unborn child is impaired.
* The cyanide affects the fetal growth by acting on the B vitamin metabolism.
* Smoking depresses appetite which may contribute to low birth weight.

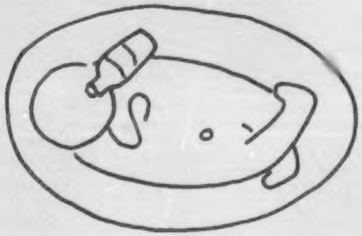
If a woman cannot stop smoking while she is planning for a child or as soon as she is pregnant, she should at least try to:
1. Stop before the fourth month of pregnancy.
2. Not inhale.
3. Reduce the number of cigarettes she smokes.

It is also very supportive if a man encourages modification of the woman's smoking or acts as a model in giving up smoking, thus taking a part in protecting his unborn child.

The runner makes a choice about smoking according to his own personal philosophy, but also according to how it will increase the risks of losing the race - cutting down on wind. A man and woman must make a choice in smoking according to their own personal philosophy but also according to the risks smoking will have on their unborn child in the future.

If you now smoke, put a plus beside smoking on the Risk Rater. If you do not smoke put a minus beside smoking. Symbolically represent this responsibility by transparency 27.

Question: How would you feel about giving an unborn child a baby bottle filled with gin and tonic?
(Use transparency 28 to illustrate this question.) Wait for reactions.



This is exactly what must be done to babies born of alcoholic mothers. Alcohol must be added to the infant's milk in decreasing amounts for two weeks. The infant is born with alcohol on it's breath and must go through withdrawal symptoms just as an adult does. The gin and tonic effects the unborn child twice as fast as the mother and in the same concentration.

Until very recently it was believed that alcohol had no effect on the unborn child. Alcohol may be the third largest cause of mental retardation. Forty to fifty percent of infants born to mothers who drink three drinks a day or go on binges are born mentally retarded as well as having some of many defects such as:
1. leisons in the eyelids
2. narrow eyes
3. an underdeveloped jaw
4. a small head
5. hyperactivity
6. skin growths
7. immobile joints

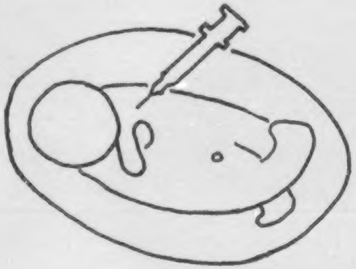
Just as Down's Syndrome children look very much like one another, so do children with the Fetal Alcohol Syndrome look like one another. This commoness is called a syndrome.

It is easier for a woman to give up drinking if the man encourages it and acts as a model by modifying his drinking habits. The man is and should be responsible for limiting the alcoholic intake of his child in the future.

The runner makes a choice about drinking according to his own personal philosophy but also according to how it will affect his reactions and motivation. A man and woman must make a choice in drinking according to their own philosophy but also according to the risks drinking will have in the future on their unborn child.

If you now drink, put a plus beside drinking on the Risk Rater. If you do not drink put a minus beside drinking. Symbolically represent this responsibility by transparency 29.

Question: Would you put a joint in the unborn baby's mouth or "shoot him up" with heroin? Use transparency 30 to represent this question. Wait for reactions?



Unthinkable? Gross! Thousands of babies if they make it to birth, are born addicted each year, and many of them prematurely. Besides being addicted, they may have Hepatitis from the mother using dirty needles. The infant will have decreased oxygen in the blood and tissues. If the addicted infant is not given extensive treatment, he may develop dehydration, respiratory distress, shock, mineral imbalance and go into a coma. Kind of a heavy load to lay on a newborn infant of a mere 5 or 6 pounds.

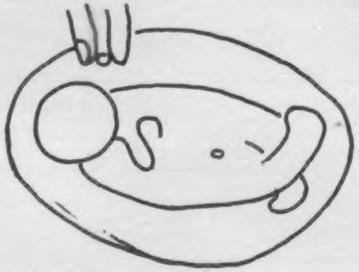
Amphetamines and barbiturates can cause birth defects, as can tranquilizers. LSD studies are inconclusive, but a limited number of studies show chromosome damage and a higher incidence of congenital defects in children of LSD users. Marijuana studies are inconclusive.

Since drug use takes place as a social thing to do, the man has a responsibility in influencing the woman to modify her drug use as they plan for a child. He will probably be one of the few people who will have such influence.

The runner must make a choice -- to get his "highs" from running or drugs. The man and woman must make the same choice -- to "get high" from planning for the 9 month race or continue drug use and risk losing that race.

Put a plus beside social drugs if you are a drug user and a minus if you are not. Symbolically represent this responsibility by transparency 31.

Question: How can "the pill" be dangerous to unborn babies, doesn't it just prevent pregnancy? (Use transparency 32 to illustrate this question.) Wait for possible answers.



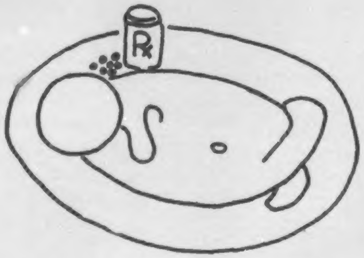
"The pill" is not 100% reliable in preventing pregnancy, so occasionally a woman is unknowingly pregnant but still taking the pill. Since 1960, millions of women have relied on birth control pills to prevent pregnancy. If they are taken during the early months of pregnancy, they can produce heart and limb abnormalities. The use of the pill should be timed so that it is not being used well before a man and woman plan to conceive a child. This must be a joint responsibility and decision between the man and woman.

Girls only! Put a plus beside the pill if you are now on it or a minus if you are not. Represent this responsibility with transparency 33.

"Drugs of Necessity"

Block one on the Risk Rater contained drugs that could be termed unnecessary, they are drugs of choice. The second block contains conditions that often call for drugs of necessity.

Question: Would you give an unborn child drugs that a doctor prescribes for you as an adult? (Use transparency 34 to illustrate this question. Wait for responses.



Because a drug is safe for an adult, does not necessarily make it safe for developing cells. There are 20 drugs or chemicals that are known to cause human defects; 600 produce congenital defects in experimental animals and 2,000 new chemicals are introduced into our environment each year. Many chemicals are regulated, but not with the protection of women of childbearing age in mind.

Besides being concerned about the effects of a "necessary" medication on an unborn baby, the woman and man must also be concerned about the stress carrying a baby has upon a mother with a particular disease or condition. The effect the mother with a particular disease or condition has upon a baby she is carrying must also be considered. It is a two-way-concern.

Let's look at a few examples of why a man and woman should seek medical advice when planning for a child if a mother has a particular disease or condition and also the medication she may be taking for that condition.

As we go through these examples, mark on the Risk Rater any disease or condition listed with a plus if it applies to you and a minus if it has no application. This applies to girls only, but boys again must be responsible for motivating the woman to consider these facts and to help her seek medical advice.

High blood pressure is often treated with RESPERINE, which causes choking, gasping and congestion in the newborn. Alternative drugs should be considered or abstaining from the drug near the woman's due date.

An underactive thyroid in the mother can contribute to lowered thyroid function in the infant causing Cretinism. The mother of the unborn child must have careful management of her thyroid supplements and nutrition. A mother with an overactive or underactive thyroid has a greater risk of having children with chromosomal abnormalities. Also thyroid studies or therapy using radioactive isotopes should not be done while a woman is pregnant.

A Diabetic woman and the man should plan pregnancies when the diabetes is well under control. The unborn baby depends on the mother for its sugar and so the mother must be under excellent medical care while pregnant. A child of a diabetic can have excessive growth before birth and thus be damaged in the birth process or have inadequate growth resulting in brain underdevelopment. ORAL INSULIN is associated with higher complication rates, so injected insulin would probably be preferable.

Cancer chemotherapy drugs are used to decrease the rate of cell growth within malignant tissue. Although it is probably unlikely that a woman with cancer would consider bearing a child, a man and woman should realize that AMINOPTERIN as well as numerous other chemotherapy drugs are definitely harmful to an unborn baby.

Epilepsy caused by abnormal bursts of electrical activity that come from within the brain are commonly treated with DILANTIN and PHENOBARBITAL. The incidence of birth defects are three to four times greater in infants born to women on these drugs. A woman who is on medicine for seizure control should have a doctor re-evaluate her need for the drug and consider modifying the dosage or type of anti-seizure medicine.

An athlete with a special physical condition must plan carefully with his doctor before he decides to go in for sports. So must a woman and man planning for a child consider that a woman carrying a baby within a body that already has some special physical condition needs careful planning with a doctor. Symbolically represent this concept with transparency 35 .

"To Test or Not To Test"

Question: How many of you know your blood type and factor? Tabulate the answers.

Let's play a game:

1. Pass out slips of paper with an Rh+ or an Rh- on each one using approximately five minuses and 25 pluses. (15% of the class should be Rh- and 85% Rh+.) Make sure at least one girl gets an Rh-.
2. **Have all the girls choose a guy for a partner. A mad scramble!**
3. Tabulate only the partners. Use a column tabulation on the board.

Rh+ Rh+	Rh- Rh-	Rh-(boy) Rh+(girl)	Rh-(girl) Rh+ (boy)

4. Circle the only column at risk. Rh- girl Rh+ boy.

The only combination at risk in childbearing is the Rh- woman and the Rh+ man combination. This guy and gal represent a woman with Rh- blood and a man with Rh+ blood. The guy has a special protein found in the surface makeup of red blood cells of some people (Rh+) while the gal does not (Rh-). It has no particular health significance to them as just man and women.

However, if a couple as represented here were to have a baby that was Rh- and during the birth process or in miscarriage, the Rh+ blood cells from the baby entered the woman's blood stream, her body would react to this foreign substance. She would start making antibodies to gobble up this foreign invader -- the Rh+ red blood cells.

The woman then carries these antibodies in her body for life and they may attack the Rh+ blood cells of the next baby she carries. (A blackboard illustration as in Figure 38 of the teacher's background material may be helpful.)

As the red blood cells are broken down, a waste product from them is deposited in the brain which does not allow the brain cells to get enough oxygen causing brain damage. This is almost entirely preventable.

The mother must be injected with immunoglobulin 72 hours after each birth, miscarriage or mismatched transfusion. This substance destroys the Rh+ blood cells that have leaked into the mother's bloodstream so that she will not produce antibodies against her Rh+ baby in the future.

Before immunoglobulin was developed in 1968, 10,000 infants a year were born dead from their Rh+ blood cells being attacked. Another 20,000 a year became mentally retarded, cerebral palsied, blind or deaf. Twenty percent of women needing immunoglobulin still do not receive it. All of the partners in the Rh- Rh+ column would theoretically have to plan for the immunoglobulin to be given to the woman after birth.

Rh type should be considered an essential component of every person's personal health knowledge. Represent this symbolically with transparency 36.

Put a plus beside Rh factor in the third block of your Risk Rater if you do not know your blood type or if you are a girl and you know it is Rh-.

There are other tests that a man and woman should have when planning for a child. Mark these with a plus if the risk applies to you and a minus if it is no risk.

1. Rubella as we learned a few weeks ago, can be devastating to an unborn baby. A woman should be tested to see if she carries the Rubella antibodies. If not she should be immunized at least 3 months before becoming pregnant. A man should be immunized to avoid spreading the disease. Put a plus beside Rubella if you have been immunized, a minus if not.

2. Venereal disease should be tested for and treated in both the man and woman before they form a child. Put a plus beside venereal disease if there is a possibility that you may be infected, put a minus if you could not be.

3. Tuberculosis should be tested for in both the man and woman, for it can cause central nervous system damage in an infant. Also STREPTOMYCIN used in T.B. treatment can cause deafness in an unborn child. Put a plus beside tuberculosis if you have not been tested for T.B., a minus if you have.

4. Phenylketonuria should be tested for in any woman planning for a child if she is mentally retarded and the cause of that mental retardation is unknown. A woman with PKU who is relatively unaffected by it herself can give birth to a child with extensive brain damage because of a high concentration of phenylalanine in her blood. This test would probably not apply to anyone in this room, so mark it with a minus.

The runner tests himself in time trials before entering a big race. No sense competing until he has "a chance" of making it. A few precautionary tests before pregnancy can improve the baby's chance of making it whole and intact.

"The Hazardous Environment"

Question: If you work after school, on Saturday, in the summer, are there any of these jobs that you feel could be a hazardous environment?

Chemicals in:

- the paint and varnish industry
- the plastic industry
- the motor industry
- the fabric industry
- the mining industry
- **automobile exhaust exposure jobs, such as toll booth** workers and parking lot attendants
- the cleaning agent industry
- the plastics industry
- the insecticide industry
- operating room personnel
- the chemical industry

These plus thousands of other jobs may be high risk for a man and woman planning for a **job**, and subsequently to their unborn child.

In Victorian England the term "mad as a hatter" arose to describe the behavior of individuals exposed to mercury fumes in the felt hat industry. Today mercury has over 3,000 industrial uses. It has widespread use in the insecticide and fungicide industry. As mercury enters lakes and rivers as industrial wastes, bacteria in the water convert one form of the metal into another deadly form, methyl mercury, which can be ingested or inhaled.

In 1969, such industrial waste poured into Minamata Bay and the tragedy of children born to Japanese women who ate shellfish from the polluted waters during pregnancy could be seen in physical deformities, tumors, cerebral palsy and mental retardation in their children.

A man and woman planning for a child who are employed in a place where chemicals of any kind are used should look up those chemicals in source books of dangerous chemicals, discuss it with their employers and also write to OSHA - The Occupational Safety Health Administration. Represent the environment concept with transparency 37.

The runner not only looks at the condition of his own body, but where he must run. Everywhere a man and woman go influences the quality of life of a future unborn child. On your risk rater, put a plus beside any of the three related risks that apply to you or if you don't know whether there is a risk or not. Put a minus if your job has no such risks.

Total up your pluses and think about yourself as a potential parent who must evaluate what risks they are bringing with them to a future unborn child. Prepare well for the nine month race!!

When the man and woman have planned well for the possibility of a child there are two do's and don'ts which surround the process of conceiving a child.

The man and woman should:

1. Space pregnancies at least two years apart. The shorter the time between pregnancies, the more likelihood there will be birth defects and obstetrical complication. (Represent this concept with transparency 38 .)

2. Plan for fertilization of a fresh egg with fresh sperm. Intercourse during the time when conception is possible is thought to increase the possibility that neither the egg or sperm will be starting to disintegrate when they join. (Represent this concept with transparency 39.)

The woman should not:

1. Take pregnancy testing pills. These are associated with central nervous system defects. (Represent this concept with transparency 40 .)

☐ Classroom Experience Options

A. Planning

1. Think of something you did before you were prepared? What age might you have been prepared? Why? If you were to do it again would it be different?
2. Show one of the following films for an introduction to this area of study. The following are excellent for the concept of planning for High Risk.
   a. Title: Now that April's Here
      Time: 19 minutes Color Movie Junior and Senior High School
      Content: An excellent contrast of what the outcome of a pregnancy which is high risk can be with planning and without planning. Great emotional impact.
   b. Title: Tomorrow Happens Today
      Time: 19 minutes Color filmstrip and record
      Junior and Senior High School
      Content: Film strip on prenatal care and protecting the unborn from V.D., Rubella virus, drugs, industrial pollutants, malnutrition and genetic defects.
   c. Title: High Risk Pregnancies
      Time: 20 minutes Color slides and script
      Junior and Senior High School
      Content: Statistics illustrating the effects of good prenatal care.

   All available from ⊗ #14

5. Use the following pamphlets for class discussion and emphasis:
   a. How A Mother Affects Her Unborn Baby
      Available from: ⬡ #5
   b. Leader's Bulletin 29
      Available from: ⬡ #20
   c. Your Head Is Your Own Thing, but...
      Available from: ⬡ #24

B. Drugs, Alcohol and Smoking

1. Show one of the following movies for an indepth understanding of the subject area:
   a. Title: Born Hooked
      Time: 10 min. color film junior and senior high school
      Content: Shows the need for special prenatal care for mothers who use Methadone and Heroin. Deals with the impact of withdrawal of the newborn.
      Available from: ⊗ #14
   b. Title: Alcohol in the Human Body (FSC-1311)
      Time: 14 min. color movie junior and senior high school
      Content: Uses animation to introduce the effects of alcohol on the human body. Explains how alcohol is absorbed into the circulation system and carried to all parts of the body. Show consequences which can lead to psychological and social problems.
      Available from: ⊗ #11 Rental: $8.25
   c. Title: Trigger Film for Alcohol Education
      Time: 7 min. per film color movie junior high school
      Content: Six movies on one reel. Each a vignette dealing with alcohol. To trigger discussion of different decision making procedures and different possible solutions.
      Available from: ⊗ #12
   d. Title: Tobacco and the Human Body (HSC-730)
      Time: 15 min. black & white film senior high school
      Content: Shows how scientists determine the content of the cigarette smoke entering the mouth and its effects on rabbits and humans. Shows how tars and nicotine from cigarette smoke are collected in the laboratory, measured and pictures their effect on skin temperature, breathing and blood vessels. Concludes by stating that each person must determine for himself whether he wishes to take the risks of smoking.
      Available from: ⊗ #11 Rental $7.00
   e. Title: Smoking and Health: A Report to Youth (ESC-1077)
      Time: 13 min. color film junior and senior high school
      Content: Uses animation to show the trachea, bronchi and lungs when affected by smoking. Stresses the symptoms and results of bronchitis and emphysema. Gears presentation to young people with a take-off on "beautiful people" cigarette commercials and shots of socializing teens.
      Available from: ⊗ #11 Rental: $8.50
   f. Title: Drugs and the Nervous System
      Time: 18 min. color film junior and senior high school
      Contents: Discusses some basic, vital facts about misuse of airplane glue, stimulants, depressants, marijuana and LSD. Discusses changes in conditions of the nervous system when these substances are taken for "kicks". The facts are presented without preaching or moralizing.
      Available from: ⊗ #9
   g. Title: LSD, Insight or Insanity (CS-1846)
      Time: 28 min. color film junior and senior high school
      Content: Illustrates some of the effects of LSD and relates that the full physiological and mental effects are still largely unknown and unpredictable. Emphasizes possible biological damage of the brain and chromosomes and for pregnant women, malformation of offspring. Presents teenagers explaining their reasons for taking LSD.
      Available from: ⊗ #11 Rental: $12.00

h. Title: Alcohol Crises for the Unborn
   Time: 15 min. color film junior and senior high school
   Content: Shows the outcome of the tragic Fetal Alcohol Syndrome from drinking during pregnancy.
   Available from: ⊗ #14

2. Pass out the following pamphlets for emphasis:
   a. What You Should Know About Alcohol and Your Baby
      Available from: ⬡ #15

   b. When You Drink Your Unborn Baby Does Too!
      Available from: ⬡ #20

   c. DATA: Drugs, Alcohol, Tobacco Abuse During Pregnancy
      Available from: ⬡ #20

3. Write to Al-anon, a group for families of alcoholics. See if they are doing anything to educate people as to the dangers of drinking
   Address: ⬡ #2

4. In small group discussion, consider "what and who should have the most influence on you to stop smoking, drinking and using drugs, before becoming pregnant."

5. Have a debate between two small teams: One for drinking and smoking during pregnancy and one against it.

6. Role Play: Have a guy try to convince a gal to give up smoking before becoming pregnant.

C. Rh Factor
1. Show the following film to present entire Rh concept:

   Title: The Rh Negative Mother
   Time: 10 min. color film junior and senior high school
   Content: Explains Rh immunization, the testing procedures involved, the effects on the fetus and methods of prevention.
   Available from: ⊗ #9

2. Pass out one or some of the following pamphlets for emphasis or discussion:
   a. Protecting Your Unborn Children From Rh Disease
      Available from: ⬡ #24

   b. The Rh Negative Woman Asks About Rho Gam
      Available from: Ortho Diagnostics, Raritan, N.J. 08869

   c. Are You His*Her Type?
      Available from: ⬡ #20

3. Have a speaker:
   a. A state legislator to discuss why Rh Factor typing is not mandatory when applying for a marriage license or when delivering a baby.
   b. An Rh- mother discuss the problems she has experienced in bearing children.

4. Have students write your local hospitals to see what their procedures are in blood factor typing in birth, miscarriages and transfusions.

5. Role Play: Rh- girl meets Rh+ boy. How will they resolve their incompatibility!?

D. Other Tests
1. Have the students write the Center for Disease Control, Atlanta, Georgia for information on immunization recommendations.
2. Have a speaker from the Board of Health discuss immunizations: procedures, requirements, importance, problems.
3. Pass out the following pamphlet for discussion:
   a. Vaccines: An Update
      Available from: ⬡ #1

4. Have the students list what immunizations they have had and what immunizations they need by checking their family immunization record.

E. Diseases
1. Have a speaker from the Diabetes Association discuss the problems of diabetes in pregnancy. ⬡ #13

2. Have a dietician from a local hospital talk on the importance of diet in pregnancy when a mother has an underactive thyroid.

3. Invite a school nurse to demonstrate the Tine Test for T.B. on a volunteer.

4. Have the school nurse take the blood pressure of volunteers from the classroom.

F. Environment
1. Show:
   a. Title: Environmental Factors
      Time: 20 min. color filmstrip and cassette junior and senior high school
      Content: Identifies environmental poisons and their sources which lead to mental retardation. Shows the resultant human condition.
      Available from: ⊗ #9

2. From the Board of Health obtain a speaker to talk on what is being done by their agency to protect pregnant women as well as potential mothers and fathers from industrial and environmental hazards.

Outside Classroom Experience Options

1. Take a mini poll on:
    a. Students who have been immunized against Rubella.
    b. Students who know their Rh factor.

2. Take an opinion poll on:
    a. What student beliefs are on the acceptability of women smoking while pregnant.
    b. Whether or not students feel alcohol can effect an unborn baby.

3. Have a small group of students check with local hospitals to see **if Rh testing is done prenatally and if immunoglobulin is available** and administered to Rh- women who need it. What are the costs involved?. Is it available to rich and poor alike?
4. Have a small group of students investigate what community organizations are concerned about assisting people involved in drug overdose and alcoholism.
5. Interview a state legislator to see what laws protect the public against lead, mercury, radiation and other environmental hazards. How does the government enforce penalties for ignoring government standards?
6. Visit a Local OSHA office to hear and see what work they are involved in.
7. Have groups of students research:
    a. Different high risk factors to consider before childbearing.
    b. Industrial and Environmental Teratogens from the resources given in the teachers background material.
8. Visit a Board of Health to hear and see what they are doing in:
    a. Disease control and testing
    b. Environmental hazard control and testing
    c. Immunization.

Action Checklist

Pass out the action checklist to summarize this area of study. (Prepared from ditto 39.)

PLANNING
FOR A CHILD

I will:

____ Consider whether I am a "high or low risk" potential parent in relation to drugs, infection, disease and testing for infection and disease.
____ Modify or stop smoking when planning for a child.
____ Modify or stop drinking when planning for a child.
____ Modify or stop social drug use when planning for a child.
____ Stop using the pill well before pregnancy if I am on it. (Girls only!)
____ Be tested for: Rubella antibodies, Rh factor, T.B. and venereal disease.
____ Consult with a doctor about any disease or special condition I have and also consider drug modification or change.
____ Request a transfer or change jobs if any chemicals or drugs at my place of work are potentially dangerous to me or an unborn child while planning for a child.
____ Space children (pregnancies) at least two years apart.
____ Conceive a child at the optimum time of fertilization.

Post Test

Give the same test used in the pretest. Let the students see how many answers that they originally did not know that they can correct. Do as an in class or homework activity. Determine the individual and class gains.

IV. The Man and Woman Planning for a Child

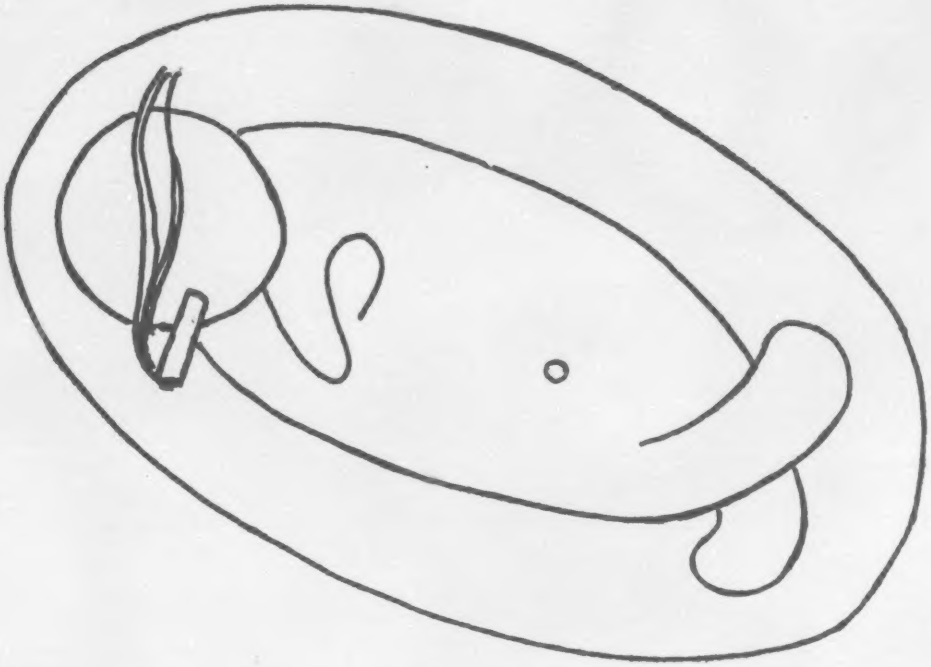
Ditto 38

THE RISK RATER

THE RISK RATER	
 Smoking Drinking Drugs The Pill Total _____	 High Blood Pressure Underactive Thyroid Overactive Thyroid Diabetes Cancer Menstrual Abnormality Allergies Seizures Total _____
 Rh Factor Rubella Immunization Venereal Disease Tuberculosis PKU (girls only) Total _____	 Work in which harmful chemicals are used Work in which harmful drugs are used Work in automobile exhaust Total _____

IV. The Man and Woman Planning for a Child

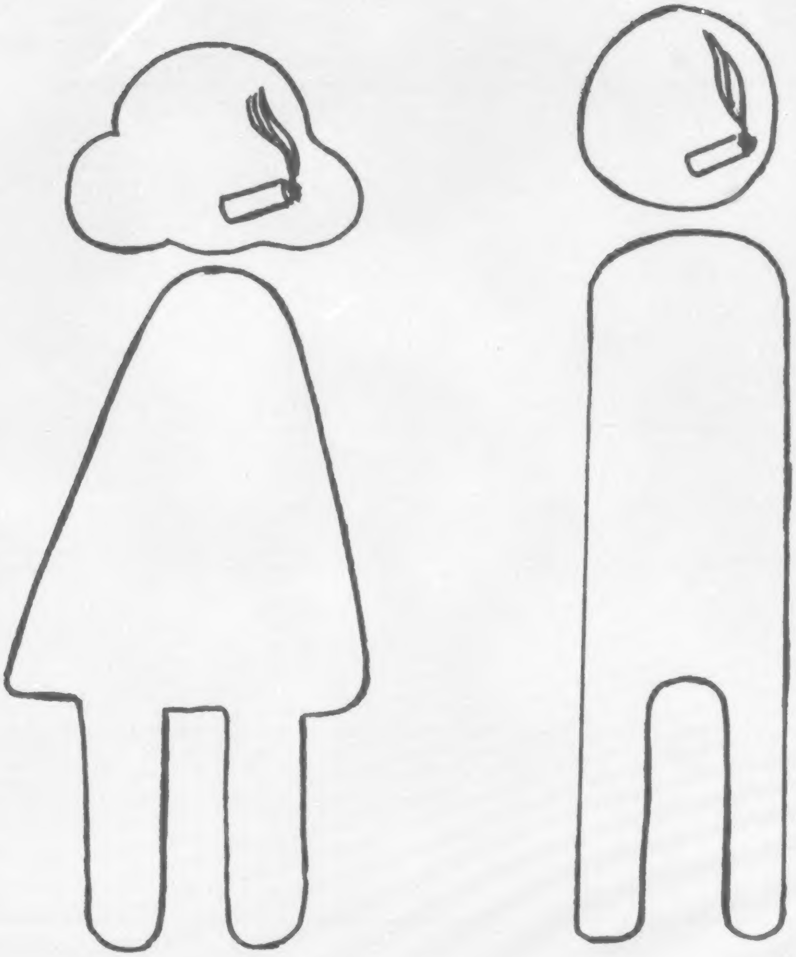
Transparency 26



IV. The Man and Woman Planning for a Child

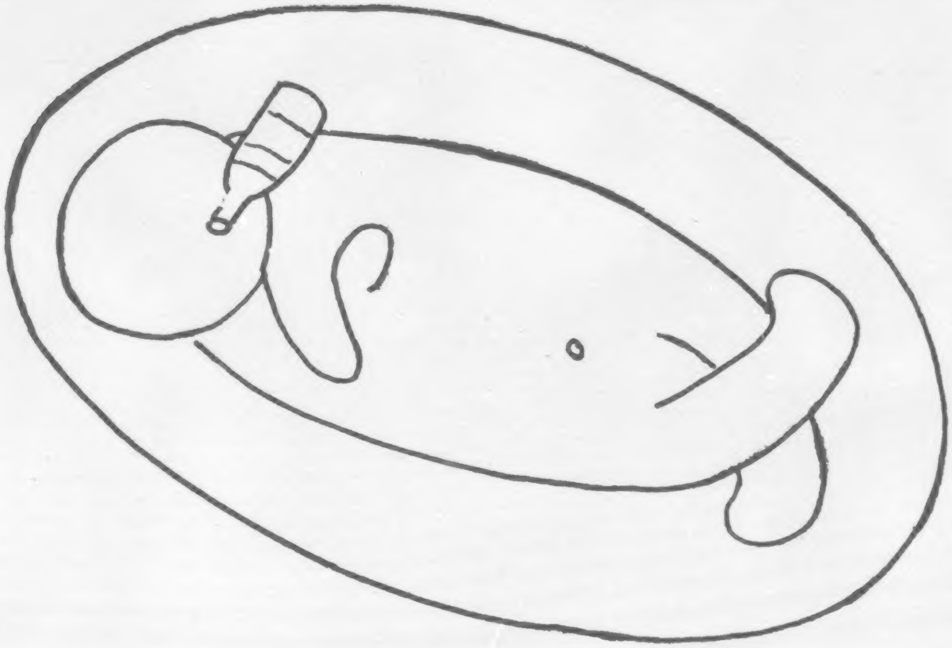
Transparency 27

SMOKING



IV. The Man and Woman Planning for a Child

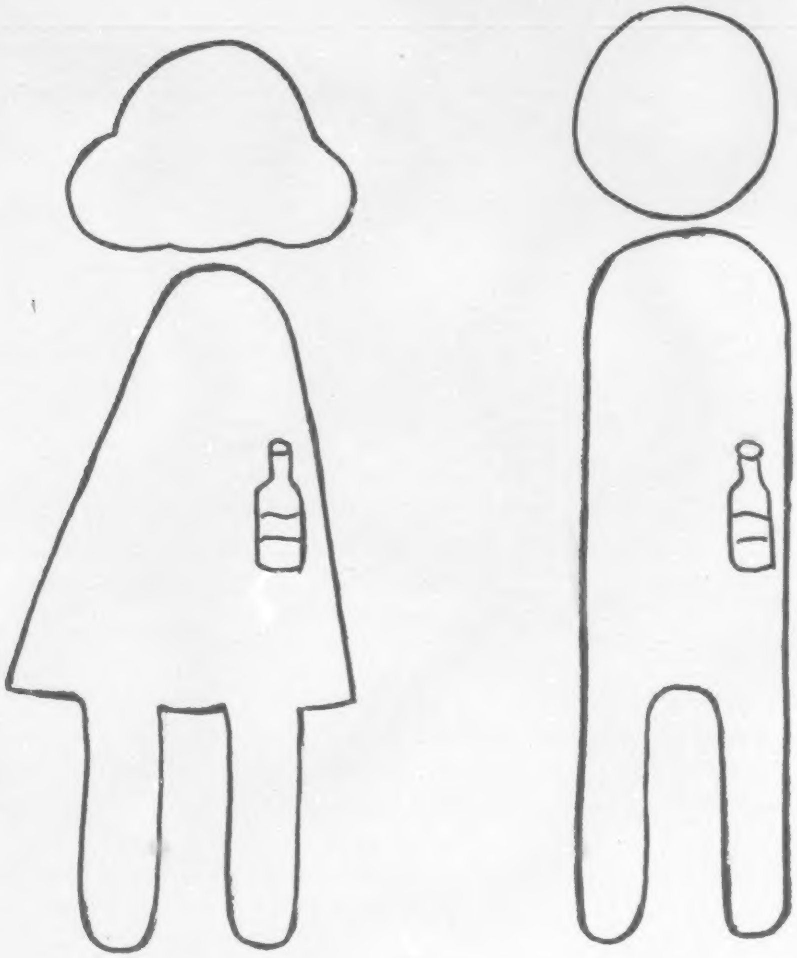
Transparency 28



IV. The Man and Woman Planning for a Child

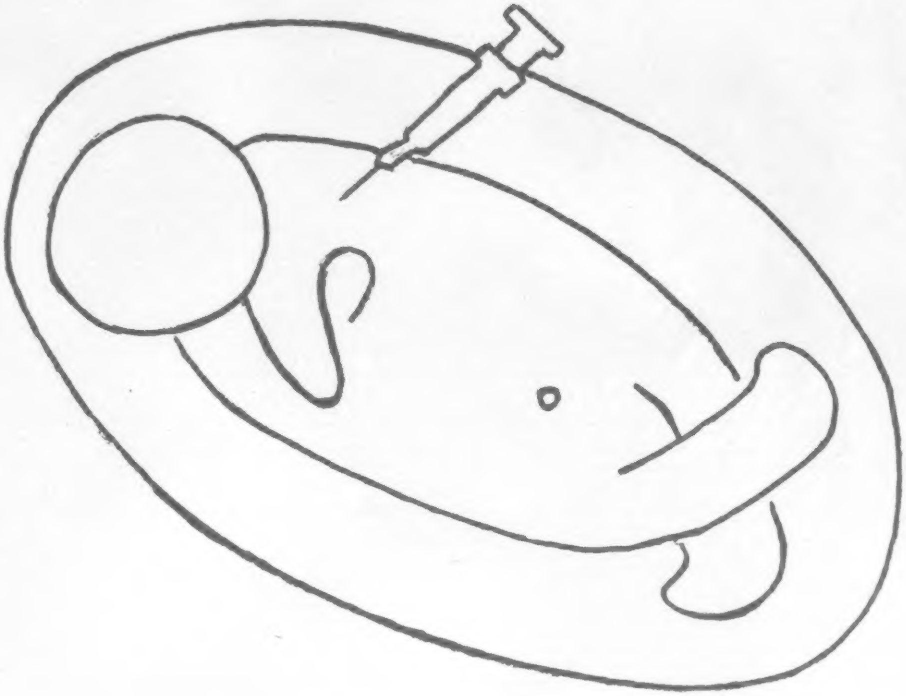
Transparency 29

DRINKING



IV. The Man and Woman Planning for a Child

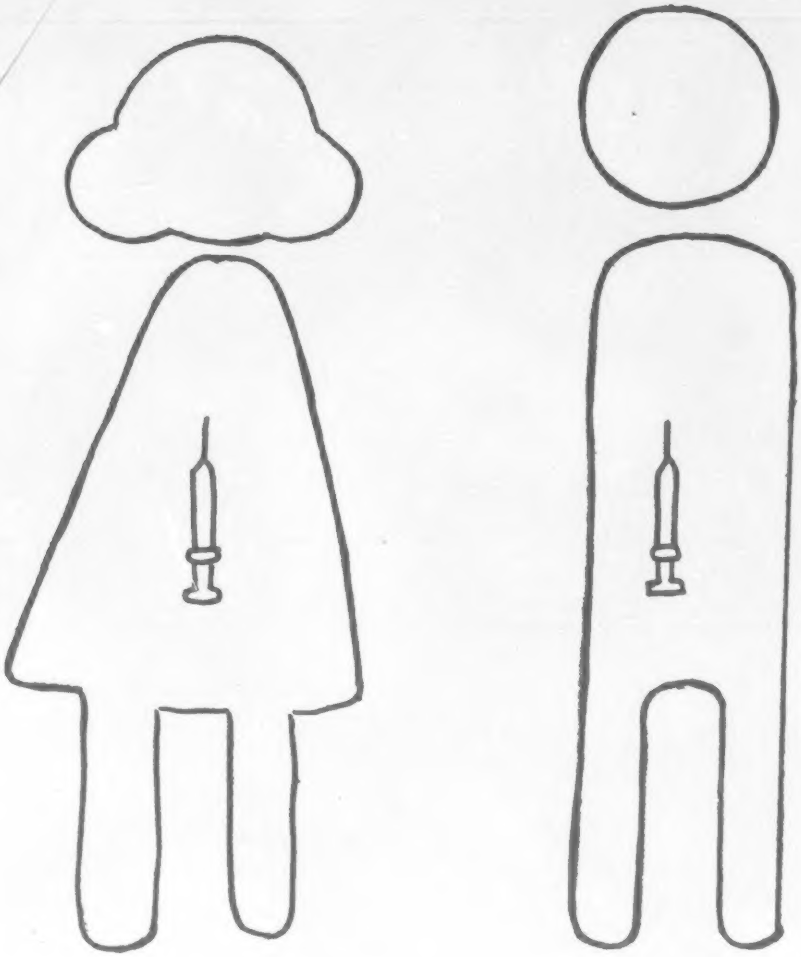
Transparency 30



IV. The Man and Woman Planning for a Child

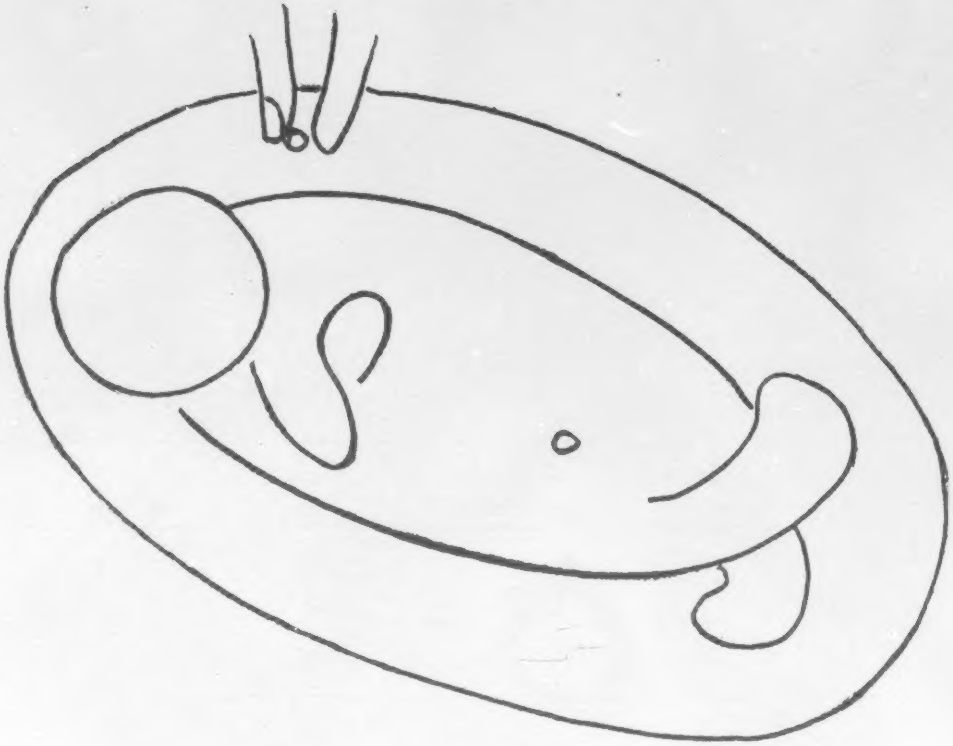
Transparency 31

DRUGS



IV. The Man and Woman Planning for a Child

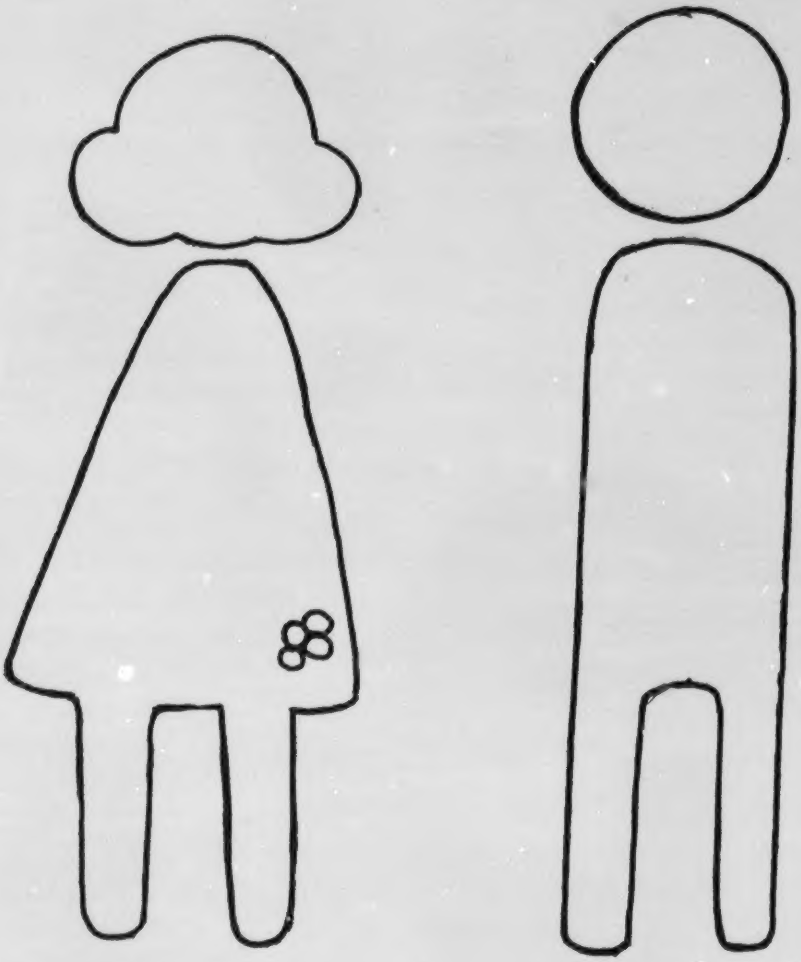
Transparency 32



IV. The Man and Woman Planning for a Child

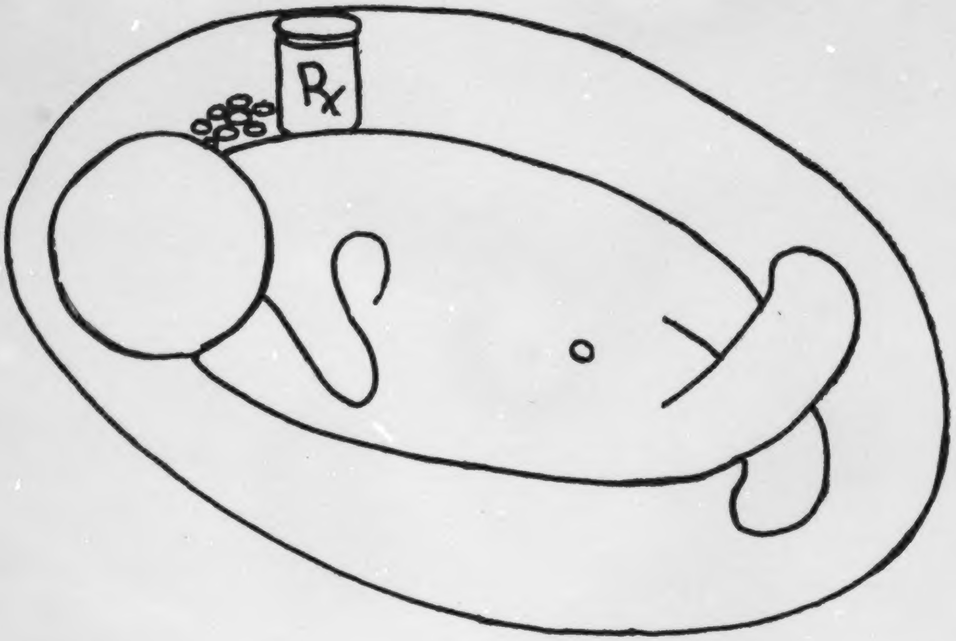
Transparency 33

THE PILL



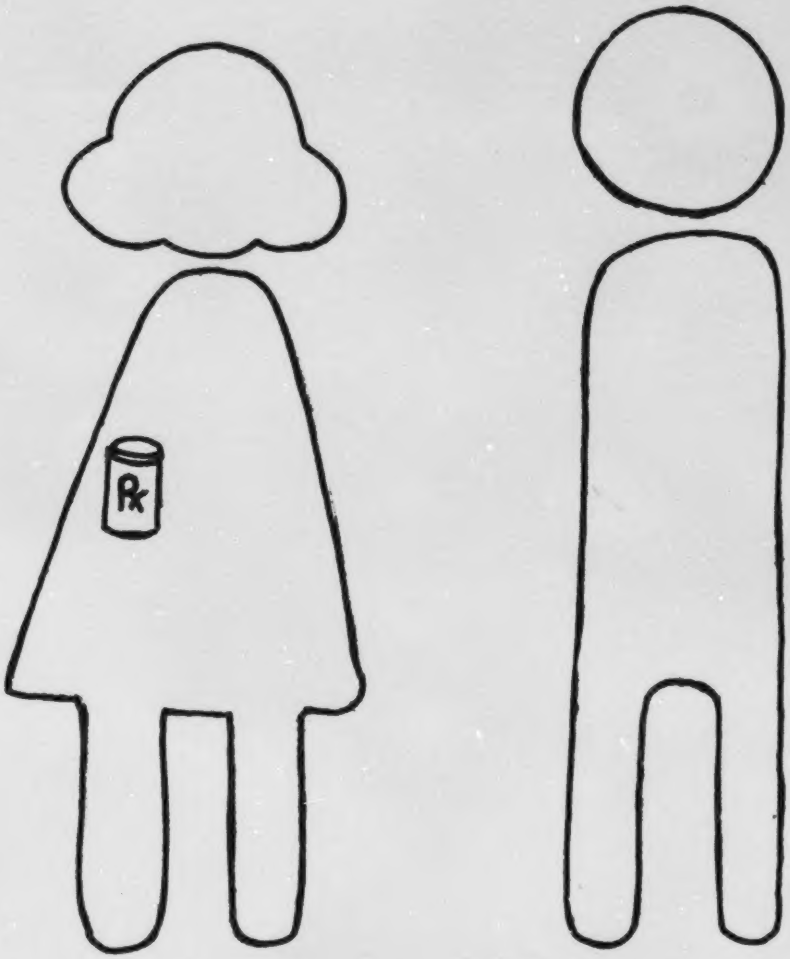
IV. The Man and Woman Planning for a Child

Transparency 34



Transparency 35

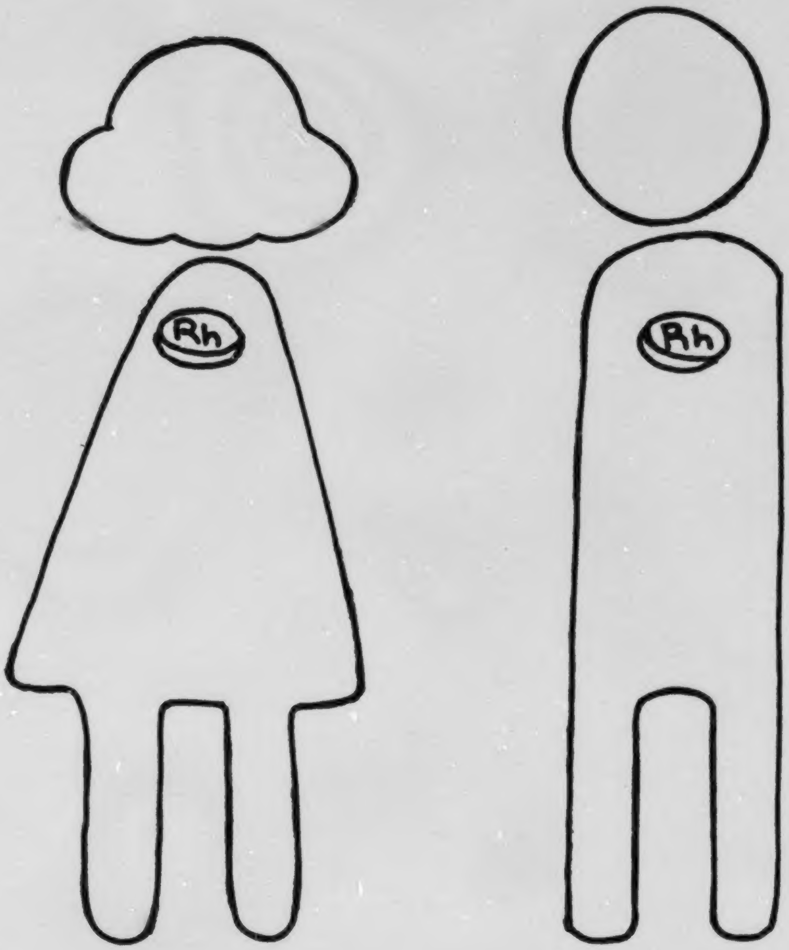
NECESSARY MEDICATION



IV. The Man and Woman Planning for a Child

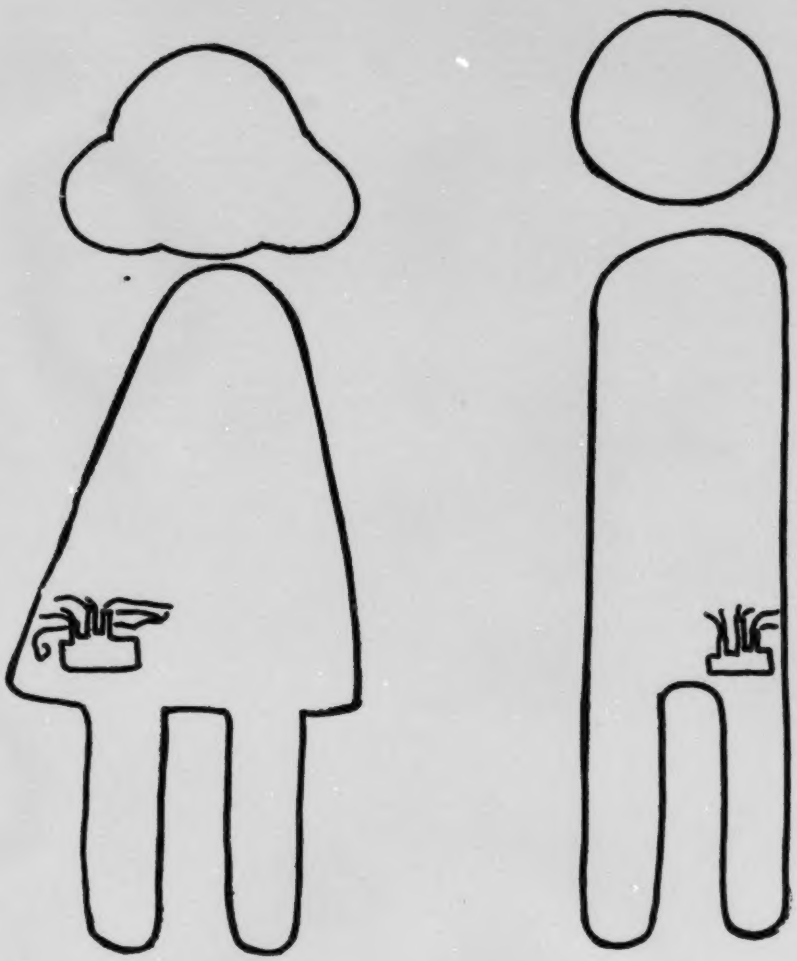
Transparency 36

Rh FACTOR AND OTHER TESTS



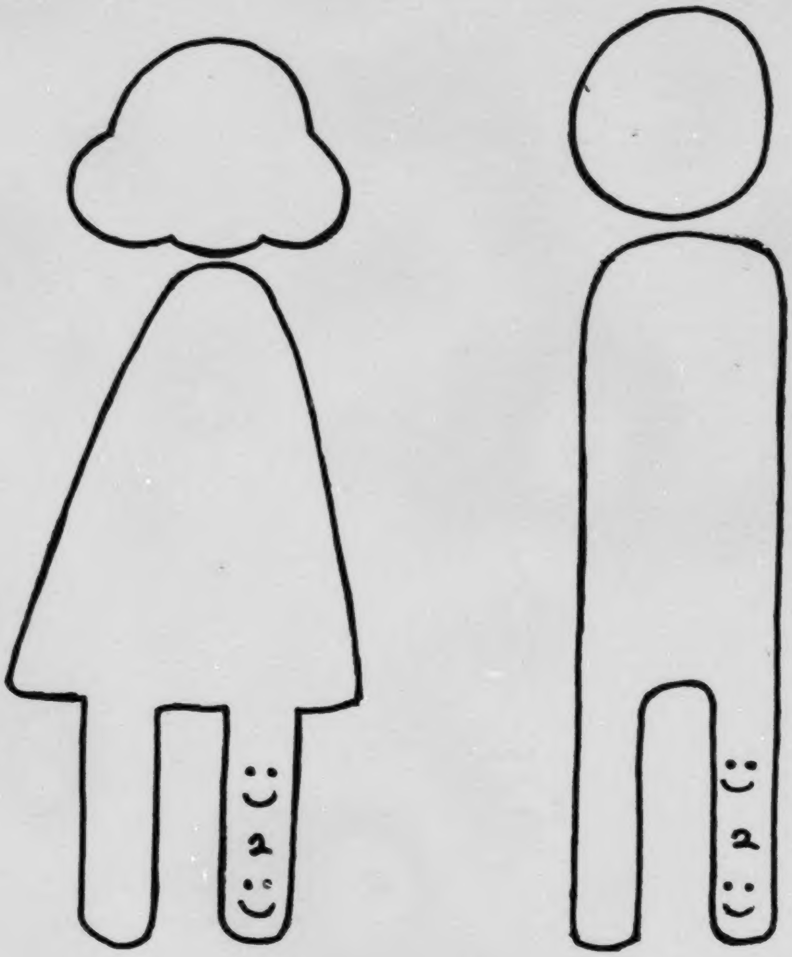
Transparency 37

JOB RELATED HAZARDS



Transparency 38

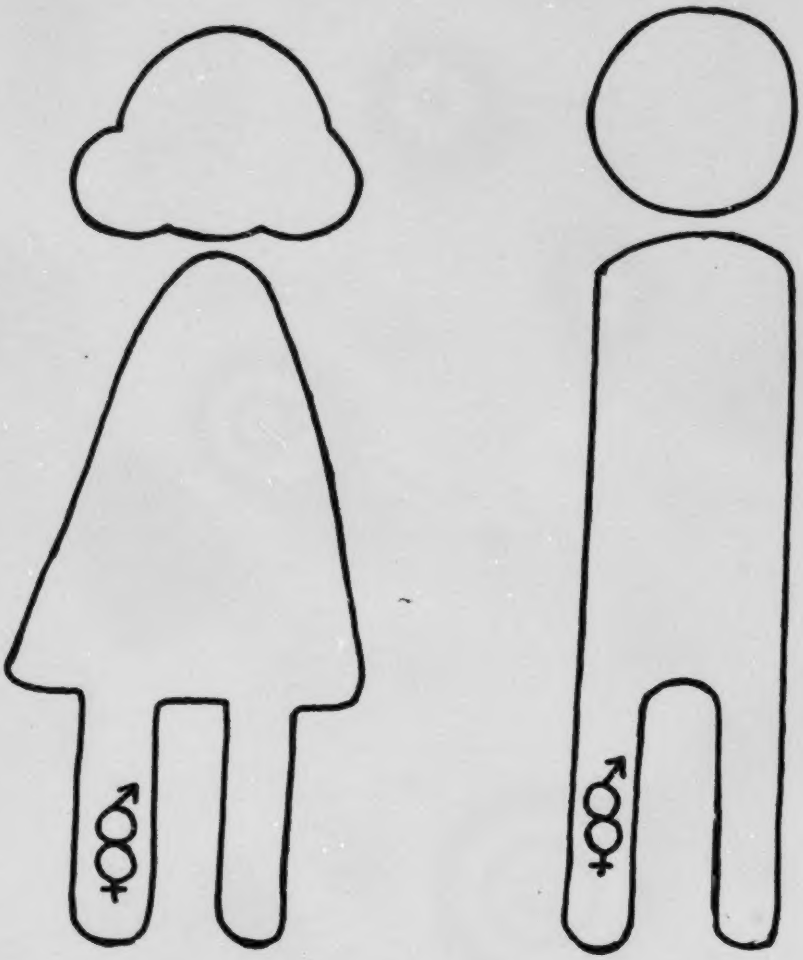
SPACING CHILDREN



IV. The Man and Woman Planning for a Child

Transparency 39

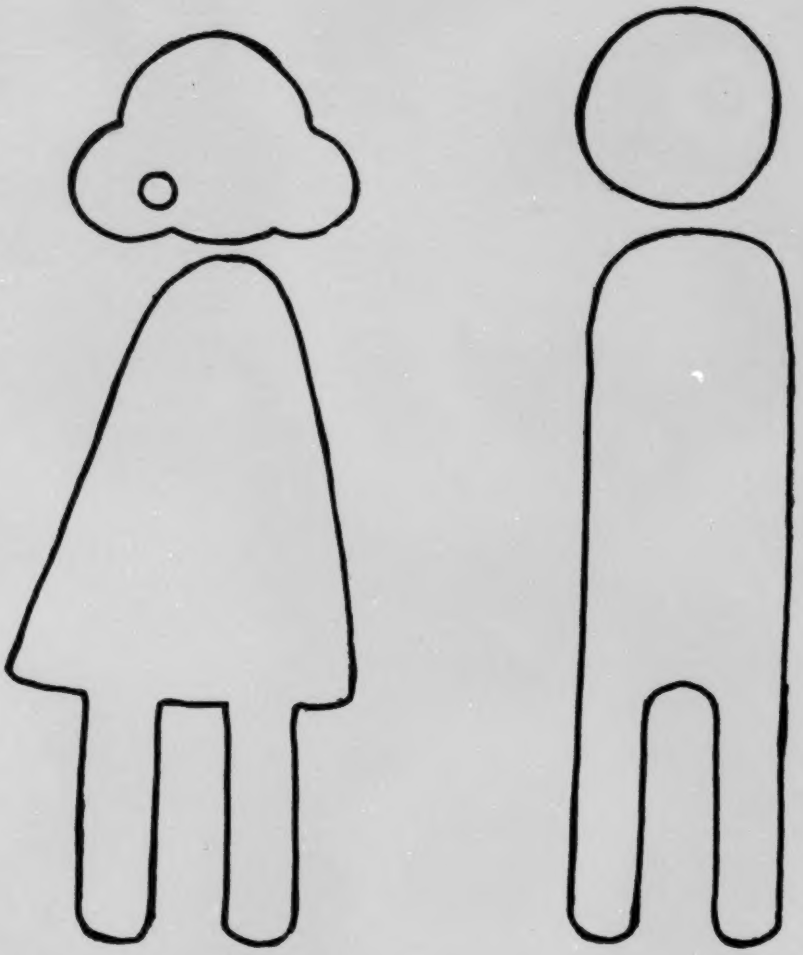
FERTILIZATION AT OPTIMUM TIME



IV. The Man and Woman Planning for a Child

Transparency 40

PREGNANCY TESTING



IV. The Man and Woman Planning for a Child

Ditto 39

I will:

____ Consider whether I am a "high or low risk" potential parent in relation to drugs, infection, disease and testing for infection and disease.

____ Modify or stop smoking when planning for a child.

____ Modify or stop drinking when planning for a child.

____ Modify or stop social drug use when planning for a child.

____ Stop using the pill well before pregnancy if I am on it (Girls only).

____ Be tested for: Rubella antibodies, Rh Factor, T.B. and venereal disease.

____ Consult with a doctor about any disease or special condition I have and also consider drug modification or change for that condition.

____ Request a transfer or change jobs if any chemicals or drugs at my place of work are potentially dangerous to me or an unborn child while planning for a child.

____ Space children (pregnancies) at least two years apart.

____ Conceive a child at the optimum time of fertilization.

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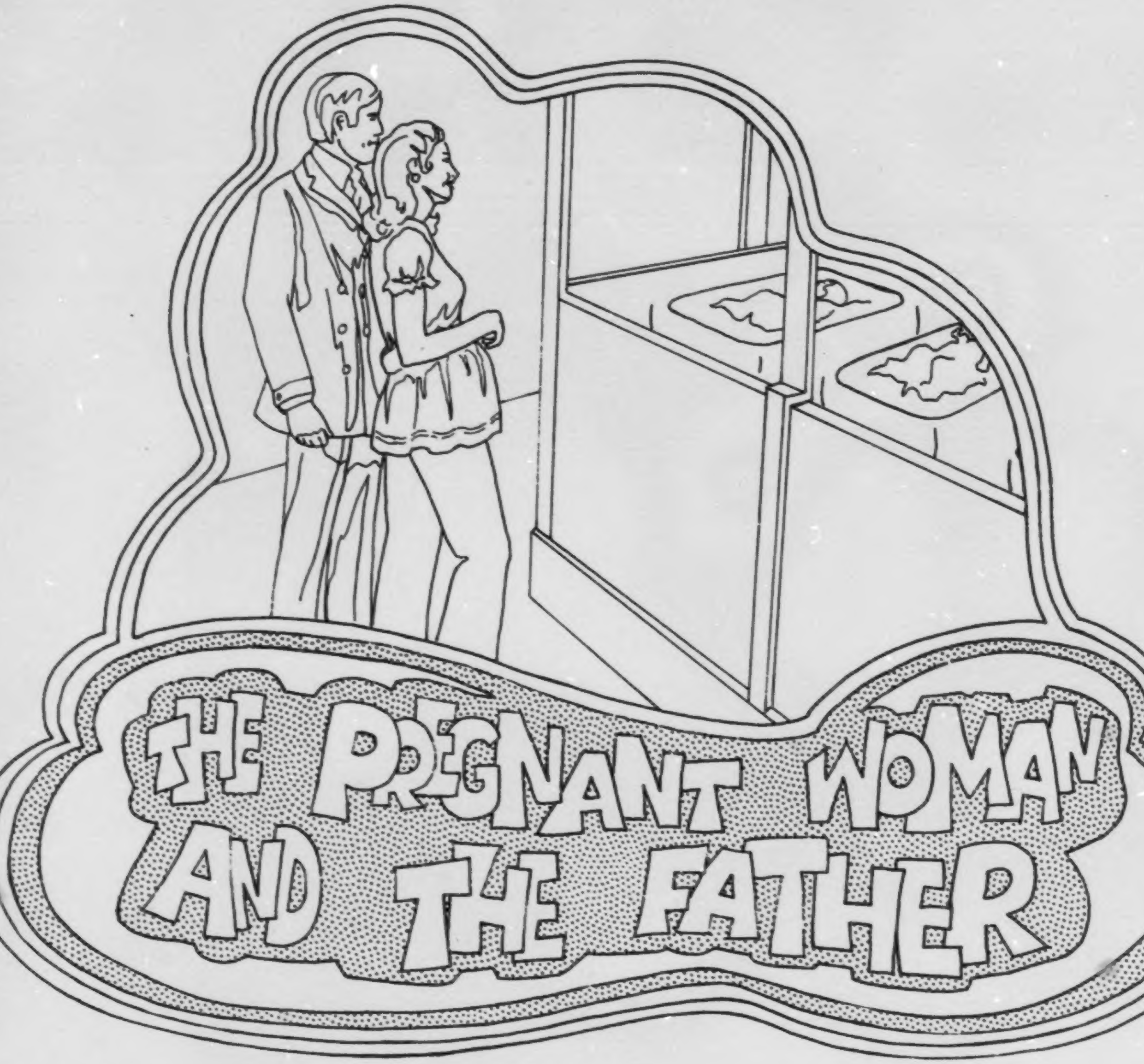

THE PREGNANT WOMAN AND THE FATHER

V. The Pregnant Woman and the Father ⇨

Their Responsibility Towards the Prevention of Mental Retardation in the Next Generation

▷ Objectives

General

a. The student will know what action he or she must take when they are a mother or father of an unborn child if they had not taken specific responsibilities as a teenager, man and woman, or man and woman planning for a child to prevent or lessen the possibility that they will have a mentally retarded child.
b. The student will know why it is important to obtain prenatal care when they are a mother or father of an unborn child and will be motivated to do so.
c. The student will understand the complications of prematurity and what he or she can do to decrease the likelihood of prematurity in an unborn child.
d. The student will realize the importance of appropriate nutrition in pregnancy and how to attain an appropriate food intake in pregnancy.
e. The student will understand that drugs and radiation are a threat to the physical and mental well-being of an unborn child and that these must be kept to a minimum or completely avoided.
f. The student will know the importance of and how to rate themself as a high or low risk potential parent.
g. The student will know how to decrease the possibility of toxemia, infection and placental disorders in pregnancy.
h. The student will understand the importance of preparing for the process of labor and birth during the nine months of pregnancy.

Specific

Cognitive

1. The student will be able to list five signs or clues to identifying the state of pregnancy.
2. The student will be able to state what must be done or not done in each of the following situations to lessen or prevent the possibility of mental retardation in an unborn child:
   a. a pregnant woman with an imcompetent cervix.
   b. a pregnant woman or father with venereal disease.
   c. a pregnant woman who has not been immunized against Rubella.
   d. a pregnant woman who smokes, drinks or uses social drugs.
   e. a pregnant woman who is going to have routine dental x-rays.
   f. a pregnant woman absolutely needs diagnostic x-rays.
   g. a pregnant woman and the father who do not know if they are a high risk parent.
   h. a Rh- pregnant woman who has antibodies building up against an Rh+ unborn child.
   i. a pregnant woman who has a special disease or condition such as diabetes or high blood pressure.
   j. a pregnant woman working with toxic chemicals.
3. The student will be able to list three reasons why prenatal care can reduce mental retardation by a possible ten percent.
4. The student will be able to tell why it is important to decide whether you are a low or high risk mother and father of an unborn child.
5. The student will be able to state two ways in which the chances of premature birth may be lessened when a woman is pregnant.
6. The student will be able to state four ways in which an unborn baby may be adversely effected by malnutrition.
7. The student will be able to give two reasons why radiation is harmful to an unborn child.
8. The student will be able to explain how a mother or father of an unborn child could determine if a drug, either prescription or over the counter, could potentially harm an unborn child.
9. The student will be able to tell how toxemia can be avoided or treated in pregnancy.
10. The student will be able to explain how a pregnant woman can contract toxoplasmosis during pregnancy.
11. The student will be able to explain how good prenatal care can lessen the chances that an unborn baby will be deprived of oxygen because of a maternal bleeding disorder.
12. The student will be able to state how good prenatal care can lessen the chances that the baby will be damaged in the birth process.
13. The student will be able to explain how the mother and father of an unborn child must take their part in preparation for the labor and birth of a child.

Affective

1. The student will feel that it is important for a mother and father of an unborn child to take the following responsibilities during pregnancy if the appropriate action was not taken as the teenager, the man and woman and/or the man and woman planning for a child.
   a. have surgical repair of an incompetent cervix.
   b. be tested for venereal disease and be treated if necessary.
   c. not be immunized for Rubella (girls only!)
   d. give up using social drugs, drinking and smoking.
   e. determine if they are high risk parents.
   f. monitor Rh antibody buildup if the mother is Rh- and the baby Rh+.

    g. consult a doctor about special conditions of the mother such as diabetes and high blood pressure and consider drug modification.
    h. transfer or quit work if coming in contact or inhaling dangerous drugs or chemicals.

2. The student will feel it is important to seek medical care as soon as they suspect that they are a mother or father of an unborn child.
3. The student will feel it important for the mother and father of an unborn child to decide whether he or she is a high or low risk parent.
4. The student will feel that it is risky for the mental and physical well-being of the child to be born prematurely or small for date of birth.
5. The student will feel that drugs and radiation are potentially harmful to an unborn baby.
6. The student will feel that good medical care can prevent or lessen the possibility of toxemia during pregnancy.
7. The student will feel that toxoplasmosis can be avoided during pregnancy.
8. The student will feel that good prenatal care can lessen the chances of oxygen deprivation of the unborn child during pregnancy.
9. The student will feel that good prenatal care is necessary to lessen the chances of the baby being damaged in birth.
10. The student will feel that the mother and father of the unborn child must prepare themselves for the labor and birth of their unborn child.

Background Information for the Teacher

A LOOK BACKWARDS

To The Teenager
To The Man and Woman
To The Man and Woman Planning For a Child

The woman has missed a menstrual period, her breasts are tender and may be a bit larger. She may be nauseated at times and needs to urinate more often.

She is pregnant. The miracle of human development is well on its way. The critical 266 days has begun. If it is a pregnancy well planned for with responsibility taken in the teen years, as man and woman and as a man and woman planning for a child the goal of having a child who will be "well born" is "well on its way". If the pregnancy just happens as many pregnancies do let's see where this woman and man stand.

In terms of action it is too late to accomplish some of the responsibilities of

the teenager
the man and woman
the man and woman planning for a child.

However it is not too late for some of the responsibilities of those phases and still again some of those responsibilities must be modified. Figure 40 summarizes this concept.

Figure 40. The responsibilities of the teenager, the man and woman and the man and woman planning for a child AS FACED FOR THE FIRST TIME AS THE PREGNANT WOMAN AND THE FATHER.

Cycle of Life	Action Checklist	Action possible if facing the responsibility for the first time as a pregnant woman and the father
I. The Teenager	___Limit child bearing years from 20 to 35 years of age.	
	___Be sexually responsible.	
	___Avoid venereal disease.	Avoid venereal disease.
	___Be tested for venereal disease and obtain treatment if infected.	Be tested for venereal disease and obtain treatment if infected.
	___Be immunized against Rubella.	Avoid immunization.
	___Eat foods that provide adequate calories and nutrition.	Eat foods that provide adequate calories, protein and nutrients.
	___Be in control of your own life in relation to drugs, self medication, alcohol and smoking.	
	___Avoid excessive or unnecessary x-rays for medical and dental diagnosis and treatment.	Do not have dental x-rays. Do not have therapeutic or diagnostic x-rays unless absolutely necessary and then only with lead shielding.

Figure 40. The responsibilities of the teenager, the man and woman and the man and woman planning for a child AS FACED FOR THE FIRST TIME AS THE PREGNANT WOMAN AND THE FATHER. (continued)

Cycle of Life	Action Checklist	Action possible if facing the responsibility for the first time as a pregnant woman and the father
	___Request proper shielding of the sex organs when being x-rayed.	
	___Request a pregnancy test before being x-rayed if there is a possibility that you are pregnant. (girls only!)	
	___Obtain cervical examination by a gynecologist if involved in frequent sexual intercourse in the young teenage years. (girls only!)	Have surgical repair of the cervix.
II. The Man and Woman	___Keep my own medical record covering at least three generations if possible.	
	___Determine if I am genetically a high risk potential parent.	
	___Receive genetic counseling before bearing children if I am a high risk parent.	

Figure 40. The responsibilities of the teenager, the man and woman and the man and woman planning for a child AS FACED FOR THE FIRST TIME AS THE PREGNANT WOMAN AND THE FATHER. (continued)

Cycle of Life	Action Checklist	Action possible if facing the responsibility for the first time as a pregnant woman and the father
III. The Man and Woman Planning For A Child	___Consider whether I am a "high or low risk" potential parent in relation to drugs, infection, disease and testing for infection and disease.	Consider if you are a high risk parent or carry a high risk child.
	___Modify or stop smoking when planning for a child	Stop smoking.
	___Modify or stop drinking when planning for a child.	Stop drinking.
	___Modify or stop social drug use when planning for a child.	Stop drug use.
	___Stop using the pill well before pregnancy if I am on it. (girls only!)	
	___Be tested for: Rubella antibodies, Rh factor, TB and venereal disease.	Monitor Rh antibody buildup to allow for transfusion of the unborn baby or selection of an optimal delivery date.
	___Consult a doctor about any disease or special condition I have and also consider drug modification or change.	Consult a doctor about any disease or special condition I have and also consider drug modification or change.

Figure 40. The responsibilities of the teenager, the man and woman and the man and woman planning for a child AS FACED FOR THE FIRST TIME AS THE PREGNANT WOMAN AND THE FATHER. (continued)

Cycle of Life	Action Checklist	Action possible if facing the responsibility for the first time as a pregnant woman and the father
	—Request a transfer or change jobs if any chemicals or drugs at my place of work are potentially dangerous to me or my unborn child while planning for a child. —Space children (pregnancies) at least two years apart. —Conceive a child at the optimum time of fertilization.	Request a transfer or change jobs if any chemicals or drugs at my place of work are potentially dangerous to my unborn child.

"The Provider . . .
The Protector . . .
The Planner . . ."

Incidents that happen within the first three months of pregnancy account for about 35% of all mental retardation. It is a very vulnerable time for the unborn child. If the mother and father could only communicate with the unborn child he or she might say (being very egocentric as all small children are)

> ***Give me all the food and oxygen that I need to live and grow. Protect me from everything harmful. Listen to me if I call for help. Get me help if I need it. Plan for the day when I choose to be born. I need and will need a great deal of help.***

The mother and father have only 266 days in which to invest for the future. The quality of life for an individual for years to come depends on how they act as

Providers for 266 days
Protectors for 266 days
Planners for 266 days

THE PROVIDER

As providers the mother and father of the unborn child must obtain medical care, prenatal care, as soon as they have any indication that they must care for an unborn child.

- In Indiana 25% of mothers did not begin prenatal care in the first three months of pregnancy in 1975.
- In the United States approximately 350,000 women give birth each year without any prenatal care.
- As many as 33% of low income pregnant women have no prenatal care.
- There are three times as many premature births among the women who do not have prenatal care as those who do have care.
- If every pregnant woman had prenatal care mental retardation would drop by 10%.
- Prenatal care can significantly reduce adverse and often irreversible effects on the central nervous system of the newborn infant.

There is nothing magical or absolute about prenatal care. However, it's most obvious purpose is to identify specific risks to mothers and unborn children. Medical and social factors intertwine to create high risk birth situations. The identification of high risk mothers and fathers is not a new concept but a matter of education and economics. Mental retardation can be reduced if there is early detection of existing or potential problems and optimal techniques of obstetrics and pediatrics are appropriately and optimally used. As a result of developments in knowledge and technology there has been a surge of effort to improve the care and management of high risk pregnancies and of high risk infants. Figure 41 summarizes high risk factors in pregnancy. A woman who fits in one or more of these descriptors of high risk should be sure that she has good prenatal care and that the doctor knows of her high risk potential.

Figure 41. High Risk Factors for Parents Planning for a Child.

I. Preconception	II. Previous Pregnancies	III. Early Pregnancy	IV. Late Pregnancy	V. Labor and Development	VI. Newborn
Family genetic, or central nervous system disorders	Infant with a genetic disorder	* COLUMN	Unwanted	Premature labor	Less than 35 week gestation
		I	Uterine bleeding	Induction of labor	
Intermarrying	Infant with a birth defect	COULD BE	Toxemia	Obstruction of birth canal	Birthweight less than 2,000 grams
Low socio-economic status	Premature or small for birth infant	HERE	Excessive amnionic fluid	Fetus and pelvic disproportion	Respiratory distress
		FOR A MAN			
Excessive radiation exposure	Excessively large infant	AND	Obstruction caused by a clot	Fetal distress	Seizures
Nutritional abnormality		WOMAN	Growth too small or large for date	Poor Progress in labor	Infection
	Caesarean section	WHO DO NOT			Congenital defects
Under 15 or over 40	Difficult childbirth		Abnormal position	Abnormal position for birth	
		PLAN	Past due		Vomiting of elimination swallowed before birth
Incompetent cervix	Stillbirth or newborn death	FOR A		Abnormal bleeding	
		CHILD*	Rupture of membrane for more than 12 hours without labor	Operative delivery	
Abnormal genital tract	Abortion or abortions				Excess acid accumulation or loss of bases
				Infection of the placenta	
High blood Pressure	Special care needed for newborn		Evidence of infection		
Under or over-active thyroid	Severe emotional problems during pregnancy and delivery			Mis-positioning of the placenta	Elevated blood sugar
Heart disease				Tissue in the amnionic fluid	Elevated breakdown products of red blood cells
Kidney disease	Excessive vomiting				

Figure 41. High Risk Factors for Parents Planning for a Child. (continued)

I. Preconception	II. Previous Pregnancies	III. Early Pregnancy	IV. Late Pregnancy	V. Labor and Development	VI. Newborn
Diabetes					Lack of oxygen
Cancer					
Anemia					Rh disease
Rh incompatibility					
Exposure to harmful drugs or chemicals					
Harmful drug intake					
Lack of rubella immunization					
Syphilis					
Tuberculosis					
Hepatitis					
PKU mother					
Children closely spaced					

Good prenatal care can make a difference in the outcome of most high risk pregnancies. Many of the "risk factors" can be medically controlled to the point of being "no risk factors".

Three obstacles stand in the way of prenatal care for all pregnant women:

1. The United States need a greater number of prenatal care facilities to serve all socio-economic levels.
2. We need to motivate pregnant women to use prenatal care facilities.
3. We need to make prenatal care services attractive.

Comprehensive care should include education, medical care, social care and good interpersonal relationships with the medical community so that pregnant women will be motivated to seek out prenatal care and to continue it after their initial visit. Women should know that prenatal care can be obtained by contacting their local hospital, the health department or the county medical society. These agencies should in turn be sensitive and responsive to inquiries and requests for prenatal care.

The pregnant woman and the father must provide the unborn child with medical care who will in turn protect the child and the mother against many of the high risk factors given in Figure 41. In addition the doctor may protect the unborn child against specific **infections and conditions which can result in mental retardation. The doctor is also vital in the following preventive aspects:**

1. Ultrasound machines using sonar waves to locate the position and note the size and structure of the fetus in the womb help the doctor plan for
   a. a child defective in structure and thus high risk.
   b. multiple births.
   c. breech or other abnormally positioned babies.
2. Using a urine test to determine hormone content (estriol) a doctor can determine if there is fetal distress and plan optimum delivery time.
3. Toxemia can be controlled or even prevented by good **prenatal care. Blood pressure readings and urinalysis can detect** high blood pressure and protein in the urine. These signs plus rapid weight gain and swelling ankles characterize toxemia which manifests itself during the latter months in pregnancy in about 5% of all women. If toxemia is not brought under control it can have devastating consequences
   - death of the mother and/or child
   - convulsions
   - prematurity by premature separation of the placenta from the uterus
   - mental handicaps
   - physical handicaps
4. The doctor can determine discrepancy in the size of the baby's head in relation to the diameter of the woman's pelvis to plan for Caesarean Section thus avoiding the banging of the baby's head against the pelvis during labor and possible lack of oxygen in a delayed birth process.
5. Two maternal bleeding disorders need precise and immediate medical intervention. Placenta Previa occurs once in every 200 pregnancies. The placenta positions itself improperly in the uterus and when stretched thinly in places during the last months of pregnancy is more likely to rupture prematurely. The placenta may also obstruct the birth canal. This results in an insufficient oxygen supply to the baby and subsequent brain damage from reduced blood flow and excessive hemorrhaging in the mother. Labor must be induced or the baby delivered by Caesarean section to avoid oxygen deprivation.

   Placenta Abruptio occurs in one out of 200 pregnancies also. The mechanism is much the same as Placenta Previa only more severe. The placenta separates from the uterus and the baby must be delivered to prevent oxygen deprivation.

   These are only two examples of possible placental problems which need expert medical recognition and intervention.
6. Infection of the pregnant woman by flu or influenza results in a 50/50 chance of the death of the unborn baby and a high incidence of brain injury if the unborn child survives. A doctor may recommend vaccination during pregnancy when an epidemic is expected with recommendations from the Center for Disease Control in Atlanta, Georgia, as to the type of vaccine advisable for pregnant women. Pregnant women should avoid illness by staying away from people who are sick and discouraging visitors who are just getting over something.

THE PROVIDER

As providers the mother and father of the unborn child must provide the nutrients needed for optimum growth and development.

In the developing countries 3% or eleven million suffer from severe protein-calorie deficiencies. Moderate malnutrition embraces another 76 million. The results from animal research are quite clear and compelling. It is doubtful that it will ever be possible in man to isolate the specific effects of malnutrition on intellectual competence so we must at least try to attend to what animal studies "suggest". If animals are subjected to faulty nutrition either in calories or protein from an

1. inadequate intake of nutrients
2. impaired assimilation of nutrients
3. impaired utilization of nutrients

during the times in which the brain is going through growth spurts lasting effects on the brain take place. Some of these may include:

1. degenerative changes in the brain
2. a smaller number of brain cells
3. smaller size brain cells
4. a reduced level of total brain protein
5. a reduced level of DNA and RNA
6. a brain that is smaller than appropriate for body weight
7. distorted brain structure
8. **demyelinization** of brain cells
9. altered enzyme activity
10. chemical, electrical and morphological changes in the brain
11. autonomical and biochemical changes in neurons and glial cells.

All of these effects in animal studies depend on the amount, duration and timing of the nutritional deprivation. However, the effects on brain development persists across generations even when the offspring of a malnourished mother are well fed after birth.

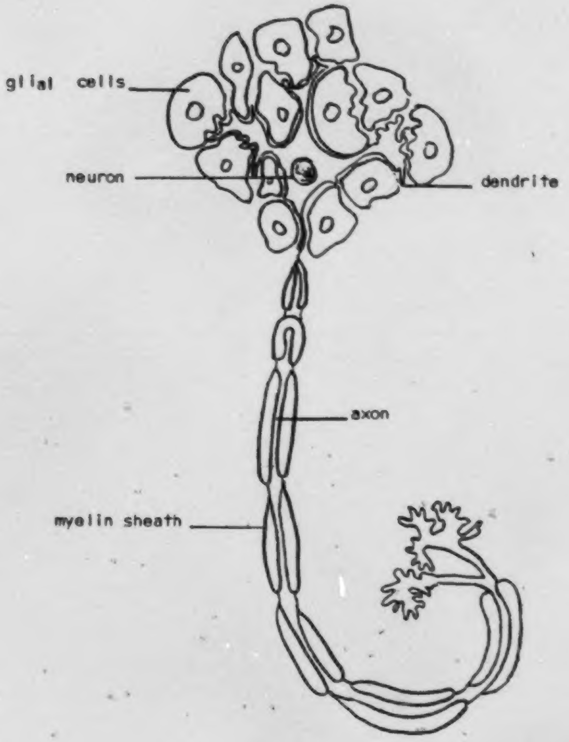
Looking at human malnutrition the long term effects on infants is well substantiated by studies in Jamaica and Uganda where malnourished infants were shorter, less intelligent, did more poorly in school, performed less well in motor coordination and were less socially competent than their classmates who were well nourished.

Also during the food shortages in Leningrad during World War II stillbirths (5.6%) and prematurity (41.2%) rates were abnormally high. In a nationwide study of fifty thousand expectant mothers, those who had protein deficient diets during pregnancy produced children whose IQ's at age four averaged sixteen points below those of well nourished mothers. A most conspicuous effect of intrauterine growth retardation could well be general lowering of intelligence rather than severe handicaps.

In a national program of food supplementation for women, infants and children (WIC), reaching 700,000 women, infants and children in the United States, those women who gained more weight before the birth of their unborn child had babies weighing more at birth than their underfed counterparts.

Lets look at the beautiful, impressive and complicated brain cell.

Figure 42. The Brain Cell



During rapid brain growth the cells are increasing in size as well as in number. From the 12th to the 18th week of life in the uterus the neurons are rapidly multiplying. From the 18th week on dendrites are growing, synaptic connectivity takes place as well as glial multiplication and myelination, the formation of the protective covering around the axon. The time of rapid brain growth is six months before and after birth. Approximately 50% of brain growth takes place during the last ten weeks of pregnancy and 50% during the first year of life. Brain growth is not complete until the second year of life. A child born to a severely malnourished mother may catch up to a great extent in physical growth with adequate diet but the impairment of the central nervous system may be irreversible and leave the individual permanently damaged with respect to intellectual functioning. Prenatal malnutrition may predispose the child to particularly severe consequences if exposed to malnutrition after birth as well.

If there is a single opportunity for the brain to grow properly and optimally it is important that the best conditions possible for nourishment be provided at this time of pregnancy by the mother and father of the unborn child. Besides effecting brain, organ and placenta development optimal nutrition can lessen the likelihood of prematurity and toxemia and provide greater reserves to deal with infection and hemorrhaging.

The journey through the pelvis to the outside world is a dangerous one. Before the 19th century women had a narrow pelvis due to a generalized vitamin D deficiency. It was before the widespread vitamin D fortification of milk. The solution was to have smaller babies to enable them to make the journey through the small diameter pelvis. Statistical evidence shows us that low birth weight infants are more frequently delivered to mothers who gain less than 15 to 20 pounds. A weight gain ranging from 22 to 30 pounds with 24 pounds being an average is now recommended. Pregnancy is not a time for dieting.

Where is that "average 24 pounds" distributed? Approximately

7½	pounds of baby
6½	pounds of placenta, amniotic fluid, uterus and breast growth
6-10	pounds of fat and water in the mother's tissue

Figure 43 summarizes the particular nutritional needs of a pregnant woman.

Figure 43. The Special Nutritional Needs of a Pregnant Woman.

Nutrient	Recommended Allowance	Excess Danger	Rationale	Recommended Daily Intake	Sample Menu
Calories	2400-2500		An approximate 20-25% increase is needed over non-pregnant needs due to increased metabolism brought about by increased tissue mass, increased cardiac output and increased respiratory rate. A deficiency in calories can cause protein to be burned as calories reducing the amount of protein available for tissue synthesis.	1 quart vitamin D fortified milk 1-2 eggs	Breakfast 1/2 grapefruit 2 poached eggs 1 slice whole grain bread with 1 tbls. butter 1 glass of milk
Protein	76 grams		The amount should make provision for the stressful situation of pregnancy and previous under-nutrition. Proteins should be of a mixed nature to complement and complete the amino acid content hence allowing for more complete utilization of protein.	2-3 servings of beef, chicken poultry or fish. (6 oz. total)	
Fat		Ketosis causing brain damage	The amount of fat in whole milk represents the ideal. It is not advisable to rely on high fat intake for calories since burning fat for energy can induce ketosis which is capable		

Figure 43. The Special Nutritional Needs of a Pregnant Woman. (continued)

Nutrient	Recommended Allowance	Excess Danger	Rationale	Recommended Daily Intake	Sample Menu
			of causing brain damage in the unborn child.		Lunch
Vitamin A	5000 I.U.	Can be toxic and is associated with an increase in incidence of birth defects and mental retardation.	Vitamin A is usually low in the diet of a young mother. Vitamin A is rapidly depleted by illness, infection or other conditions of stress.	at least 2 tbls. butter, margarine or oil	meat sandwich on whole grain bread fruit and cottage cheese salad
Vitamin D	400 I.U.	Can be toxic. Can calcify heart valve and severely damage blood vessels.		4-5 servings of whole grain bread cereal or rice	carrot sticks I glass of milk
Vitamin E	15 mg.	Toxic in excessive amounts.	Promotes more efficient oxygen utilization by the blood.		
Vitamin C	80 mg.	Dependency states from excessive amounts.	The requirements vary widely according to metabolism, drug intake, infection and other stress states.		

Figure 43. The Special Nutritional Needs of a Pregnant Woman. (continued)

Nutrient	Recommended Allowance	Excess Danger	Rationale	Recommended Daily Intake	Sample Menu
			It is important for the utilization of iron and folic acid.		
Vitamin B1 Thiamine	1.4 mg.		Since a deficiency may produce some of the physiological changes common in pregnancy such as indigestion, constipation, lowered gastric motility and lowered hydrochloric acid secretion it is important for pregnant women to get thiamine daily.		Dinner fish rice (whole grain) green beans
Vitamin B_2	1.6 mg.		A coenzyme essential for growth.		tossed salad
Vitamin B_3 Niacin	16 mg.				I glass of milk
Vitamin B_6 Pyridoxine	2.5 mg.	Dependency state. Repeated and prolonged convulsions in the infant.	Important for protein metabolism. Has been used as a treatment for nausea and vomiting.		
Vitamin B_{12} Cobalamin	4 microg.		There is a danger of severe B_{12} deficiency in true vegetarians.		

Figure 43. The Special Nutritional Needs of a Pregnant Woman. (continued)

Nutrient	Recommended Allowance	Excess Danger	Rationale	Recommended Daily Intake	Sample Menu
Folic Acid	0.8 mg.		The folic acid requirement is doubled for pregnant women. It is important for red blood cell formation and in all growth and reproduction. Deficiencies in folic acid are tied to fetal defects and severe separation of the placenta from the wall of the uterus. Folacin is also important to the immune system.		**Snack** tapioca pudding 1 glass of milk
Potassium	2-4 g.		If a pregnant woman is on thiazide diuretics for toxemia there is a loss of potassium.		
Iron	18 mg.	Neonatal jaundice	Important for formation and the subsequent delivery of oxygen to cells, nerves and muscles. Especially important in the 3rd trimester when the growing fetus stores iron for early postnatal life.		
Iodine	0.13 mg.		Necessary for thyroxine formation which regulates all oxidation. Prevents cretinism and goiter.		

Figure 43. The Special Nutritional Needs of a Pregnant Woman. (continued)

Nutrient	Recommended Allowance	Excess Danger	Rationale	Recommended Daily Intake	Sample Menu
Calcium	1.2 g.		Vital to the formation of bones, teeth and muscle action, blood clotting and nerve transmission.	4 servings of vegetables one deep yellow one leafy green 1 serving of liver per week	
Phosphorous	1.2 g.		Bone formation. Acid-base balance.		
Magnesium	50 mg.		Bone and teeth formation. Carbohydrate and protein metabolism.		
Sodium	salt to taste		Without adequate sodium low blood volume could result and compromise the placental function. Intrauterine growth retardation can result from a low sodium intake inhibiting the transfer of nutrients across the placental membrane.		
Vitamin K		Large or repeated doses taken prior to birth may produce severe anemia with an increase in kernicterus			

It should be stressed that vitamins taken in excessive amounts can result in toxicity and dependency states as well as actual physical and mental damage to the unborn child. The overzealous use of vitamins and minerals is risky business. In excess they become chemicals which must be stored, disposed of or build up in inappropriate places within the body. Toxicity can result from excessive A, D, E and K intakes. Dependency states can result from high intakes of C and B_6.

THE PROTECTOR

Besides all of the infections, disease and special conditions already listed as high risk considerations the mother and father of an unborn child need to be aware of toxoplasmosis so that they can protect their unborn child against this protozoa.

Toxoplasmosis is amazingly prevelant. One in every one thousand infants is infected. Many more pregnant women, two in 1000, have been infected. There is a 50% chance that the infection will pass through the placenta to the child. Ten percent of the 3,000 infants born infected with toxoplasmosis each year are severely brain damaged. Other defects suffered by the infant may include

- hydrocephaly
- cerebral palsy
- seizures
- blindness
- hearing loss
- epilepsy
- central nervous system leisions
- microcephaly
- intracerebral calcifications
- inflammation of the retina

An infected child may appear normal at birth and even until his or her 20's when the toxoplasma cysts rupture releasing thousands of parasites which attack the eyes, heart, internal organs and the central nervous system.

Toxoplasmosis is a more prevalent health problem than either Rubella or PKU but its devastation to the unborn child has had little publicity. However, the mother and father of an unborn child can do some very specific things to protect their child from this infection.

1. All beef, pork and lamb should be cooked until well done because the protozoa cysts exist in the muscle of meat.
2. Cat litter boxes should not be emptied while pregnant.
3. Hands should be washed well after handling a cat. Better yet a cat should not be kept as a pet during pregnancy.

The natural reservoir of the toxoplasma gondi sporozoan is the mouse and most every cat comes in contact with mice! The spores passed in the feces of infected cats can be inhaled or ingested. The symptoms of infection in humans are similar to the flu or many times there are no symptoms at all. If a person has been infected they carry antibodies against toxoplasmosis. Approximately 50 million Americans carry such antibodies. However, the fetus does not have the ability to make such antibodies and takes the effects of the infection with full force.

THE MOTHER AND FATHER OF AN UNBORN CHILD MUST ALSO PROTECT THAT INFANT FROM A WORLD WHICH USES THOUSANDS OF CHEMICALS AND DRUGS. Harmful drugs and chemicals cause at least 3% of all mental retardation. A number of these drugs and chemicals which relate to special maternal diseases or conditions and those which relate to place of employment have already been discussed in the man and woman planning for a child. What follows are examples of additional drugs and chemicals which may be used by the woman during pregnancy or used commonly in the home and general environment.

The average pregnant woman takes seven different drugs during pregnancy most of which are not prescribed. Ninety percent of pregnant women take some drugs during pregnancy. Four percent take ten or more. The most common drugs taken during pregnancy are:

- aspirin
- antihistimines
- tranquilizers
- laxatives
- nasal decongestants
- megavitamins.

The most common drugs taken by the pregnant teenager are:

- alcohol
- smoke
- aspirin.

The array of drugs found in the average person's medicine cabinet is potentially destructive to an unborn child. The average family has 30 drugs in their medicine cabinet; 5 of these are prescriptions, 25 nonprescription drugs. Every drug has side effects and can produce complications which could be disastrous to the unborn child.

The ways in which a drug may be harmful to an unborn child vary:

1. Drugs may interfere with organ growth or cell differentiation and result in a deviation from normal human development.
2. The penetrability of the placenta may be altered thus reducing the flow of food and oxygen to the unborn child or magnifying the drug concentration flowing to the child.

3. The newborn brain is extremely sensitive to drug induced balances in blood waste products called bilirubin. Bilirubin is normally handled by the liver and excreted via the bile into the feces. However, an immature liver does not get rid of bilirubin efficiently. The bilirubin buildup causes jaundice which is called Kernicterus when the bilirubin concentration is excessive. Kernicterus can cause permanent and devastating brain malfunction. Drugs play two roles in this phenomena. A drug can act on the liver directly and impair the handling of bilirubin. A drug can separate the bilirubin from blood proteins to which it is normally bound. This is more likely to happen when a drug is taken near the end of pregnancy and is caused by a number of drugs.

Figure 44 summarizes a few examples of drugs of various risks which might be taken during pregnancy, the reason a pregnant woman might be taking them, the effect of the drug on the infant and alternatives to taking that specific drug.

Figure 44. The Effect of a Few Common Drugs on Unborn Child.

Drug	Maternal Use	Effect on the Unborn	Alternative
Coumarin	An anticoagulant used for blood clots.	May cause bleeding before or during birth resulting in brain damage.	Heparin does not cross the placenta.
Diuretics	Used to treat toxemia particularly water retention.	Water and salt imbalance. An electrolyte imbalance may result in brain damage	Special diet and rest. Tolerating swollen ankles.
Streptomycin	To treat infection in the mother.	Impairment of kidneys, hearing and balance.	Use of penicillin which is relatively safe.
Aspirin	For aches, pain, fever. Almost 80% of over the counter drugs contain aspirin.	Death. Congenital deformities. Bleeding under the skull causing brain damage. Hemorrhaging during birth.	Sleep and relaxation. Tylenol for fever.
Tetracyclines	For acne	Stunts bone and teeth growth.	Soap and water.

The fact that a drug has been given during pregnancy without serious side effects does not imply that it is safe for all unborn children or at any time during pregnancy. A great deal depends on:

1. The time of pregnancy in which the drug is given.
2. The dosage of the drug taken.
3. The length of time the drug is taken.
4. The genetic predisposition of the infant.
5. How all of the above conditions interact.

The known or suspected risks of various drugs taken during pregnancy are summarized in a listing given in Caring For Your Unborn Child by Barbara and Ronald Gots and printed with permission by the publisher.

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KNOWN OR SUSPECTED RISKS
OF VARIOUS DRUGS TAKEN DURING PREGNANCY

Legend -

?	The drug has not been sufficiently well studied to date to allow useful or accurate recommendations. If possible avoid these, particularly during the first trimester.
+	Some studies have been performed and no serious fetal consequences have yet been identified. This doesn't mean the drug is safe. It merely means that it may be relatively safe.
++	Some studies or theoretical considerations suggest possible hazards to the fetus or embryo.
+++	Means that the drug or related drugs are probably risky. In some cases this assessment is based on hard laboratory data; in others it is supported by strong theoretical likelihood.
++++	Some studies have conclusively demonstrated hazards to the fetus or embryo.

	First Trimester	Second Trimester	Third Trimester
Acetaminophen	?	?	?
Adrenal cortex hormones	++	+	+
Alcohol (small)	+	+	+
Alcohol (large)	++++	++++	++++
Alka-Seltzer	+++	+++	+++
Allerest	?	?	?
Aluminum Hydroxide	++	+	+
Aminophylline	?	?	?
Amphetamines	+++	++	++
Anacin	+++	++	++
Aspirin	+++	++	++
ARM	+	+	+
Barbiturates (small)	+	+	+
Barbiturates (large)	+	+	+
Belladonnas	+	+	+
Bendectine	+	+	+
Birth Control Pills	++	++	++
Bonine	++	+	+
Bufferin	+++	++	++
Caffeine	++	++	++
Cephaloridine	++	++	++
Cephalothin	+	+	+
Chloramphenicol	++	++	+++
Chlorothiazide	++	++	+++
Chlorpheniramine	?	?	?
Codeine (small)	+	+	+
Codeine (large)	+++	+++	++++
Compoz	?	?	?
Contac	?	?	?
Coricidin	++	++	++
Coumarin	+++	++	+++
Cyclizine	++	+	+
Cyclopropane	++	+	+
Darvon	++	+	+
Darvon Compound	+++	++	++
Datril	?	?	?
Demerol (small)	+	+	+
Demerol (large)	+++	+++	++++
Dextromethorphan	?	?	?
Diazepam	+++	++	++
Diethylstilbestrol	++++	++	+
Dilantin	+++	+	+
Diphenhydramine	+++	++	+
Dimenhydrinate	+	+	+
Doans Pills	+++	++	++
Dristan	+++	++	++
Empirin	+++	++	++
Ephedrine	?	?	?
Equanil	+++	++	++
Erythromycin	+	+	+
Ethacrinic Acid	++	++	+++
Excedrin	+++	++	++
Ex-lax	+	+	+
Flagyl	+++	++	++
Folic Acid	++	+	+
4-Way Cold Tablets	+++	++	++
Durosemide	++	++	+++
Gentamycin	+++	+++	+++
Gelusil	++	+	+
Geritol	++	+	+
Halothane	++	+	+
Heparin	+	+	+
Heroin (large)	+++	+++	++++
Hydralazine	+	+	+
Hydrochlorothiazide	++	++	+++
Hydroxyzine	+	+	+
Influenza Vaccine	++	+	+
Insulin	+	+	+
Iodides	+++	+++	+++
Isoproterenol	++	++	++
Kanamycin	+++	+++	+++
Kaopectate	+	+	+
Librium	+++	++	++
LSD	+	+	+
Maalox	++	+	+
Magnesium Hydroxide	++	+	+
Marazine	++	+	+

	First Trimester	Second Trimester	Third Trimester
Marijuana	?	?	?
Meclizine	++	+	+
Meprobamate	+++	++	++
Methotrexate	++++	+++	+++
Methyldopa	+	+	+
Methylphenidate	?	?	?
Metronidazole	+++	++	++
Miltown	+++	++	++
Morphine (small)	+	+	+
Morphine (large)	+++	+++	++++
Nitrofurantoins	+	+	+
Nitrous Oxide	+	+	+
Nytol	?	?	?
Ny Quil	?	?	?
Paregoric	+	+	+
Penicillin	+	+	+
Pentazocine	?	?	?
Percodan (small)	+++	++	++
Percodan (large)	+++	+++	++++
Phenacetin	?	?	?
Pheniramine	?	?	?
Phenobarbital	+++	++	++
Phenteramine	?	?	?
Phenylephrine	?	?	?
Phenylpropanolamine	?	?	?
Preparation H	+	+	+
Promethazine	++	+	+
Propoxyphene	++	+	+
Pyridoxine	+	+	+
Pyrilamine	?	?	?
Quinine	+++	+++	+++
Reserpine	+	+	+
Robitussin	?	?	?
Sinarest	?	?	?
Sine Off	+++	++	++
Sine-Aid	+++	++	++
Sinutab	?	?	?
Sleep-Eze	?	?	?
Sominex	+++	++	++
Sodium Bicarbonate	++	++	++
Talwin	?	?	?
Tetracyclines	+	+++	+++
Theophylline	?	?	?
Tigan	+++	++	+
Tolbutamide	+++	+++	+++
Tricyclic Antidepressants	++	+	+
Trimethobenzamide	+++	++	+
Tripelennamine	?	?	?
Tylenol	?	?	?
Vitamin A*	+++	+++	+++
Vitamin B's	+	+	+
Vitamin C	?	?	?
Vitamin D	+++	++	++
Vitamin E	++	+	+
Vitamin K	+	+	+++
Valium	+++	++	++
Vanquish	+++	++	++

Notes -

1. The notations ?, +, +++, ++++ indicate that we know about the hazards, but they don't indicate how great the hazards actually are. In other words, all drugs with ++++ are known to present certain hazards to the unborn child. However, all drugs with ++++ are not equally hazardous.
2. *The notations "small" and "large" are used with a variety of addicting and abused drugs. "Small" refers to the usual dosage employed for valid medical indications. "Large" applies to excessive dosages characteristic of illicit or addictive use.
3. **The dangers of vitamins refers to massive quantities occasionally used by food faddists.

The mother and father must also protect their unborn child from chemicals that are routinely a part of our environment. Two examples are lead and nitrates.

Nitrates in themselves are not toxic but when they are ingested are converted to nitrates which combine with the hemoglobin of the blood and cause a lack of oxygen transport by the blood. The big word for this phenomena is methemoglobinemia which can result in central nervous system damage or death. Nitrates are being introduced into our environment at an ever increasing rate. Nitrates are a component of:

1. fertilizers
2. herbicides (weed killers)
3. meat preservatives
4. color enhancers

A pregnant woman should avoid:

1. Water of a high nitrate concentration. (Fertilizer and livestock runoff to rivers, streams and underground water tables cause this high concentration.)
2. Excessive amounts of beets, spinach, broccoli, celery, lettuce, radishes, kale, mustard greens and collards which are high in nitrates.
3. Excessive amounts of sausage, cured meats, ham, bacon and smoked fish products.

Lead poisoning in man has long been recognized as a cause of stillbirths and malformations. Lead circulates thru the body in the blood stream carried by the red blood cells. When the amount is too excessive to be carried in the red blood cells it is stored in the bones and then mobilized and recirculated at times of stress. An accumulation of blood lead levels in a pregnant woman can be transmitted across the placenta. The lead acts as a cellular poison interfering with the enzymatic process of the cell often causing irreversible damage: liver, kidney, heart and central nervous system damage. Lead may be ingested or inhaled. The absorption rate in adults is 10% and in children 53%. Sources of lead inhalation or ingestion are:

1. lead bearing plaster and paint (Massachusetts is the only state which has removed both indoor and outdoor lead base paint from the market)
2. pottery glazing (lead "bleeds out" when dissolved by warm or acidic beverages)
3. vinyl plastic
4. insecticides
5. lead plumbing
6. fallout from smelters
7. newsprint
8. airborne automobile exhaust
9. soil and dust containing lead
10. industrial vapor.
11. pencil lead (most are graphite)
12. cosmetic.

In 1970 The Lead Poison Prevention Act provided funds for the inspection of housing and screening of children for lead. Lead screening (FEP: Free Erythrocyte Protoporphyrin) costs approximately:

$2.00	per person (from blood sample)
$5.00	for a confirming test
$250.00	for chelation treatment

Chelation is injecting a chemical into the body which combines with lead and draws it out of the circulating blood to be excreted.

A pregnant woman should:

1. Not paint while pregnant and most certainly not with lead base paint.
2. Not use glazed pottery of dubious glazing standards.
3. Wash all fruits and vegetables with soap and water.
4. Keep cosmetic use to a minimum.
5. Carry out actions suggested in Unit IV relating to job related hazards.

Chemicals used in the home should be used cautiously and kept to a bare minimum.

- Some aerosols have flurocarbon propellants which are closely related to Halothane which has been indicated in birth defects and should be avoided.
- When using cleaners or polishes gloves should be used and the area well ventilated.
- Many cosmetics contain mercury, arsenic and lead which are all toxic to the unborn child. A pregnant woman's best bet is to look natural!
- Hair dyes are absorbed thru the skin and are questionable both in cancer causation and cell and gene damage.

THE MOTHER AND FATHER MUST PROTECT THEIR UNBORN CHILD FROM THE DANGERS OF RADIATION. This hazard has been recognized since the 1930's. Radiation acts on the cells of the body and particularly on the complex chemical processes within the cell. Rapidly dividing, non differentiated cells are more susceptible to damage than non-dividing specialized cells.

Damage to the unborn child from radiation can include:

- a brain that is small in relation to body weight
- excessive fluid in the brain
- spinal defects
- cleft palate
- retarded growth
- pigment degeneration of the retina
- cataracts
- genital and skeletal malformations

A pregnant woman should:
1. Have no dental x-rays.
2. Have medical x-rays only if absolutely necessary and then only with appropriate lead shielding of the mother.
3. Not work in a job which exposes or risks exposing the unborn child to x-rays.
4. Have x-rays of the pelvic area only very close to delivery if it is necessary for decisions about the birth process.
5. Use sonography which is a relatively new medical tool using sound waves rather than light waves for a good reason. Its overuse is not advisable since it is a new type of exposure with the possibility that it may have unknown risks.

THE PLANNER

A mother and father must plan to participate in the birth process enabling the emerging infant to have the optimum amount of oxygen during the critical time of transition from his interuterine life to life in the world. A mother and father who chose natural or prepared childbirth must prepare and plan for the event months in advance with special breathing and muscle exercises and lessons on what labor and delivery are all about. A natural childbirth course in a mother's or father's area can be located by contacting

The American Society for Psychoprophylaxis
In Obstetrics
7 West 96th Street
New York, New York 10025

If a home birth is planned a pregnant woman and the father should be under the care of an obstetrician for prenatal care. If a nurse-midwife, who is a graduate nurse with two years of special postgraduate study in obstetrics, is to deliver the baby an obstetrician should still be on call to assist in births if complications should arise.

The mother and father of the unborn child have
... provided
... protected
... planned
during the 266 days when the unborn child has been growing. They have answered his call for help...help in that miraculous process of growing from one cell to billions. He or she now awaits their entrance into the world.

Pretest

Cognitive

1. A woman who is pregnant and has frequent intercourse as a young woman may have a baby who is premature because of
   - _____a. an incompetent cervix
   - _____b. venereal disease
   - _____c. both of the above

2. A pregnant woman who has not been immunized against Rubella should
   - _____a. be immunized immediately
   - _____b. be tested for Rubella antibodies
   - _____c. receive gammaglobulin

3. A man whose child is carried by a woman who smokes, drinks or is on drugs should
   - _____a. stop all those habits to serve as a model for the mother
   - _____b. encourage the mother of his unborn child to give up these drugs for the sake of the child
   - _____c. both of the above

4. An Rh- pregnant woman carrying an Rh+ baby should have a doctor
   - _____a. give her RhoGam within 72 hours after birth
   - _____b. monitor antibody buildup
   - _____c. one of the above

5. Drug change or modification must be considered when
   - _____a. a mother is on a drug for high blood pressure
   - _____b. a mother is on a drug for infection
   - _____c. both of the above

6. A sign of pregnancy is
   - _____a. frequent urination and nausea
   - _____b. missing of a menstrual period and a felt need for more sleep
   - _____c. all of the above

7. If a pregnant woman has a continuing headache and swelling of the ankles she should
   - _____a. take an aspirin and stay off her feet
   - _____b. take a diuretic
   - _____c. call the doctor

8. If every pregnant woman had prenatal care mental retardation could be reduced by approximately
   - _____a. 70%
   - _____b. 40%
   - _____c. 10%

9. If a man or woman are a "high risk potential parent" they should
   - _____a. seek special medical help during pregnancy
   - _____b. plan to have the baby in a hospital equipped to handle high risk pregnancy and infants
   - _____c. both of the above

10. The chances of a premature or a small for date baby can be lessened by
    - _____a. good nutrition and good prenatal care
    - _____b. control of infection and disease in the mother
    - _____c. all of the above

11. Good nutrition, especially high protein intake, can effect the
    - _____a. need for anesthetic during delivery
    - _____b. size and number of brain cells
    - _____c. blood type

12. Radiation and drugs more readily damage cells which are
    - _____a. not dividing
    - _____b. rapidly dividing
    - _____c. neither of the above

13. A drug is relatively safe for the unborn child if
    - _____a. it is for a maternal disease
    - _____b. it did not effect the unborn child in a previous pregnancy
    - _____c. neither of the above

14. Toxoplasmosis may be avoided in pregnancy by
    - _____a. immunization or vaccination
    - _____b. cooking meat well done and avoiding animal excretion
    - _____c. oral medication or shots

15. If the placenta separates too early from the wall of the uterus
    - _____a. the baby may have to be delivered by caesarean section
    - _____b. labor may have to be induced
    - _____c. either of the above

16. The size of the pelvic area of a pregnant woman in relation to the size of the unborn child must be decided

_____a. during birth
_____b. before birth
_____c. during labor

17. The mother and father of the unborn child should prepare themselves for birth and labor to

_____a. enable the baby to have the optimum amount of oxygen during labor and birth
_____b. enable the mother and father to help with the birth process
_____c. both of the above

Key: 1.c, 2.b, 3.c, 4.c, 5.c, 6.c, 7.c, 8.b, 9.c, 10.c, 11.b, 12.b, 13.c, 14.b, 15.c, 16.b, 17.c.

Affective Barometer

Circle the word or words which best represent the intensity of your feelings.

1. I feel that a pregnant woman who has had frequent sexual intercourse during the teenage years may need special medical help to lessen the chances of prematurity in her unborn child.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

2. I feel that it is important for every mother and father of an unborn child to be tested for and treated if necessary for venereal disease if the possibility exists that they may be infected.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

3. I feel that a woman should be immunized for Rubella during pregnancy.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

4. I feel that a pregnant woman should not smoke, drink or use social drugs during pregnancy.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

5. I feel that a pregnant woman and the father should find out if they are high risk parents.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

6. I feel that a woman who has a special condition such as diabetes or heart disease needs special medical attention during pregnancy.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

7. I feel that it is important for a man and woman to seek medical care as soon as they suspect that they are a mother and/or father of an unborn child.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

8. I feel that good medical care is needed to treat or prevent toxemia during pregnancy.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

9. I feel that it is important to decide whether I am a high or low risk potential parent.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

10. I feel that good nutrition is important for the optimum development of an unborn child.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

11. I feel that drugs and radiation are potentially harmful to the unborn child.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

12. I feel that the mother and father of the unborn child must prepare themselves for the labor and birth of their unborn child to optimize the child's chances of being well born.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

△ **Mini Lecture or Presentation**

"The Signals"

A woman misses a menstrual period.
Her breasts seem tender and maybe a bit larger.
She may feel nauseated at times.
She has a need to urinate more often.

The miracle of human life has begun. These signals tell a woman that the critical 266 days have begun for a new human being.

If the pregnancy is a planned event and the responsibilities of

- the teenager
- the man and woman
- the man and woman planning for a child

have been taken the pregnant woman and the father of the child have only to take the responsibilities of pregnancy and the trip towards a "baby-well-born" is along its way.

If the pregnancy is unplanned as many are let's see what needs to be done when the SIGNALS APPEAR.

Pass out the ditto which goes through the action checklist of the teenager, the man and woman, the man and woman planning for a child. (Action Checklist Review prepared from ditto 40.) Have students pay particular attention to the right hand column as you methodically go through the:

ACTION POSSIBLE IF THINKING OF THE RESPONSIBILITY OF AN UNBORN CHILD FOR THE FIRST TIME AS EXPECTANT PARENTS.

ACTION CHECKLIST REVIEW

Action To Be Taken Before Pregnancy	Possible Action When Expectant parents
I want to: - Learn as a potential parent how I can specifically take action to prevent mental retardation or lessen the probability that I will have a handicapped child.	Learn as a parent how I can specifically take action to prevent mental retardation or lessen the probability that my child will be handicapped.
- Limit the childbearing years from 20 to 35 years of age.	
- Be sexually responsible.	
- Avoid venereal disease.	Avoid venereal disease.
- Be tested for venereal disease if infection is a possibility and obtain treatment if necessary.	Be tested for venereal disease and obtain treatment if infected.
- Be immunized against Rubella.	Avoid immunization.
- Eat foods that provide a diet adequate in calories and nutrients.	Eat foods that provide adequate calories, protein and nutrients.
- Be in control of your own life in relation to drugs, self medication, alcohol and smoking.	
- Avoid excessive or unnecessary x-rays for medical and dental diagnosis and treatment	Do not have dental x-rays.
- Request proper shielding of the sex organs when being x-rayed. (particularly males!)	Do not have therapeutic or diagnostic x-rays unless absolutely necessary and then only with lead shielding.

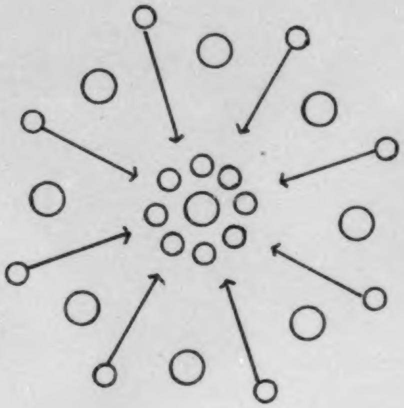
ACTION CHECKLIST REVIEW
(continued)

Action to Be Taken Before Pregnancy	Possible Action When Expectant Parents
- (Girls only!) Request a pregnancy test before being x-rayed if there is any possibility of pregnancy.	
- (Girls only!) Obtain regular cervical examinations by a gynecologist if involved in frequent sexual intercourse in the young teenage years.	Have surgical repair of the cervix.
- Keep my own medical record covering at least three generations if possible.	
- Determine if I am genetically a high risk potential parent.	
- Receive genetic counseling before bearing children if I am a high risk parent.	
- Consider whether I am a "high or low risk" potential parent in relation to drugs, infection, disease and testing for infection and disease.	Consider if you are a high risk parent or carry a high risk child.
- Modify or stop smoking when planning for a child.	Stop smoking.
- Modify or stop drinking when planning for a child.	Stop drinking.
- Modify or stop social drug use when planning for a child.	Stop drug use.
- Stop using the pill well before pregnancy if I am on it. (Girls only!)	

ACTION CHECKLIST REVIEW
(continued)

Action to Be Taken Before Pregnancy	Possible Action When Expectant Parents
- Be tested for: Rubella antibodies, Rh factor, T.B. and venereal disease.	Monitor Rh antibody buildup to allow for transfusion of the unborn baby or selection of an optimal delivery date.
- Consult with a doctor about any disease or special condition I have and also consider drug modification or change.	Consult with a doctor about any disease or special condition I have and also consider drug modification or change.
- Request a transfer or change jobs if any chemicals or drugs at my place of work are potentially dangerous to me or my unborn child while planning for a child.	Request a transfer or change jobs if any chemicals or drugs at my place of work are dangerous to my unborn child.
- Space children (pregnancies) at least two years apart.	
- Conceive a child at the optimum time of fertilization.	

"The Provider, Protector, Planner Formation"



The formation represents an unborn child in the center. A circle of providers sit around the unborn child. Next comes a circle of larger circles representing the placenta through which things can pass. The outside ring is made up of things from which the unborn child must be protected.

Let's push all the desks and chairs against the wall. Noise, noise, noise!! Everyone will become a part of this "formation". I'm the coach, you are the players. Here's your plays. (Prepare Play Cards from dittos 41 through 49.) Listen to the coach for your play. Feel free to add actions, expression, dramatization as long as we stay just serious enough to get the point or meaning. Each play has a number, the location of the play and "the play". The coach will "coach" from time to time. See if you can see what the formation represents when it is completed.

Instructor: Play 1
Student: 1

Play # 1	Location of the Play: Sitting in the middle of the floor.
The Play: "I am an unborn child starting my 266 days of growth from one cell to billions of cells. My first three months of life are very vulnerable. Things that can happen to me in the first three months of life account for 35% of all mental retardation. The quality of these 266 days of unborn life determine the quality of my entire life."	

Instructor: Play 2
Students: 2-9

Play # 2	Location of the Play: Sitting in a large circle around Player 1.
The Play: "We are the placenta through which all things must pass to the unborn child. People use to think that I protected the unborn child from everything harmful. Actually I let not only good things in from the outside world but also the bad. My blood and that of the baby do not mix but come so close that I let oxygen, nutrients and some drugs, antibodies, some disease and some infections into the baby."	

Instructor: Play 3
Student: 1

Play # 3

Location of the Play: Still sitting in the center of the room.

The Play: "Give me all the food and oxygen that I need to live and grow. Protect me from everything harmful. Listen to me if I call for help. Get me help if I need it. Plan for the day when I choose to be born. I will need a great deal of help. I want to be born whole, healthy and strong. Help me."

Instructor: Play 4
Student: 10

Play # 4

Location of the Play: Pass through the large circle and sit in a circle around Player 1.

The Play: "I am medical care often called prenatal care. I came as soon as I knew you started your growth. 350,000 babies a year are born without me. As many as 1/3 of all pregnant women and the fathers do not seek medical care. If they all did mental retardation could be reduced by a whopping 10%. It seems so easy. I can help your mother and father recognize specific high risks which may affect you. Here are the high risk factors which everyone should know if they are involved in this formation. (Instructor passes out the high risk cards to everyone prepared from ditto 50.) Mental retardation can be reduced or prevented if a woman and man fit into one or more of these categories are absolutely sure that they seek good prenatal care and that the doctor knows specifically of his and/or her risk potential. Good prenatal care can make a difference in the outcome of most high risk pregnancies."

Instructor: Play 5
Student: 11

Play # 5

Location of the Play: Pass through the large circle and sit in a circle around Player 1.

The Play: "I am breech birth. Prenatal care can locate the position, size and structure of the fetus in the womb using an ultrasound machine and plan for breech births, multiple births and even a child of defective structure."

Instructor: Play 6
Student: 12

Play # 6

Location of the Play: Pass through the large circle and sit in a circle around Player 1.

The Play: "I am fetal distress. Using a urine test which is a routine part of prenatal care the doctor can determine if the unborn child is in distress and then plan delivery at the best possible time."

Instructor: Play 7
Student: 13

Play # 7

Location of the Play: Pass through the large circle and sit in a circle around Player 1.

The Play: "Toxemia is rather common in pregnant women. It is characterized by high blood pressure, rapid weight gain, swelling ankles and protein in the urine. It can be controlled and even prevented by good prenatal care. If toxemia is not controlled it can cause convulsions, prematurity and mental and physical handicaps in that unborn infant."

Instructor: Play 8
Student: 14

Play # 8	Location of the Play: Pass through the large circle and sit in a circle around Player I.
The Play: "Another point for prenatal care. If the pelvis of the mother is too small for the size of the infant the head can ram against the pelvic floor during labor and also deprive the baby of oxygen because birth is delayed. During prenatal care the size of the pelvis in relation to the size of the baby can be determined and a caesarean section planned if necessary."	

Instructor: Play 9
Student: 15

Play # 9	Location of the Play: Pass through the large circle and sit in a circle around Player I
The Play: "Quite often, one in every 200 pregnancies, the placenta does not position itself properly in the uterus and when stretched thinly in places during the last months of pregnancy it may tear away from the uterus wall early or obstruct the birth canal. This can result in a lack of oxygen to the infant and subsequent brain damage. If a mother has good prenatal care labor can be induced or the baby delivered by caesarean section to avoid oxygen deprivation if this placenta problem develops."	

Instructor: Play 10
Student: 16

Play # 10	Location of the Play: Pass through the large circle and sit in a circle around Player I.
The Play: "I am a flu epidemic! If such an epidemic threatens sometime during the 9 months of pregnancy a doctor may suggest vaccination with a "flu shot" with a type recommended for pregnant women from the Center for Disease Control in Atlanta, Georgia. Influenza can cause a number of birth defects in the unborn child."	

Instructor: Play 11
Student: 17, 18, 19, 20

Play # 11	Location of the Play: Pass through the large circle and sit in a circle around Player I.
The Play: "I am good nutrition adequate protein adequate calories vitamins and minerals during pregnancy. For the brain and body to grow properly and optimally it is important that the best conditions possible for nourishment be provided at this time by the mother and father of the unborn child. I brought you some brain cells. (Instructor flashes the brain cell transparency prepared from transparency 41 on the wall on a screen.) During rapid growth the cells are increasing in size as well as number. Their protective covering is also being formed to safeguard the central nervous system from insult and trauma. The enzyme systems within each cell are being laid down. The time of rapid brain growth is 6 months before and 6 months after birth. A child born to a severely malnourished mother may catch up to a great extent in physical growth with an adequate diet but impairment of the central nervous system may be irreversible and leave the individual permanently damaged with respect to intellectual functioning. Optimal nutrition can lessen the likelihood of prematurity and toxemia and provide greater reserves to deal with infection and hemorrhaging."	

Instructor: Play 12
Student: 21

Play # 12	Location of the Play: Pass through the large circle and sit in a circle around Player I.
The Play: "I am weight gain. If you are going to be born at full size your mother should gain from 22 to 30 pounds. Years ago before milk was fortified with vitamin D women had narrow pelvises and doctors advised keeping weight down during pregnancy to keep the baby small enough to pass through a relatively small pelvis. We know now that women who gain less than 15 to 20 pounds are likely to have low birth weight babies. So a pregnant woman should consume about 2400 calories a day with plenty of protein as a part of those calories."	

Instructor: Play 13
Student: 22

Play # 13	Location of the Play: Pass through the large circle and sit in a circle around Player 1.

The Play: "The unborn child will need vitamins and minerals. Iron and folic acid should probably be supplemented under the doctor's supervision. Iron is needed for hemoglobin which transports oxygen to the cells. Folicin is necessary for optimum placental function as is sodium. (Walk to the circle outside of the "placental circle".) However, vitamins taken in excessive amounts can result in toxic and dependant states. The overzealous use of vitamins and minerals is risky for the unborn child. In excess they become chemicals which must be stored, disposed of or built up in inappropriate places within the body. For example:

Excessive Vitamin A can cause mental retardation.
Excessive Vitamin D can damage major blood vessels.
Excessive Vitamin C can cause dependency states.
Excessive Vitamin B_6 can lead to repeated and prolonged convulsions in the infant and subsequent brain damage.
Excessive Iron can cause neonatal jaundice.
Excessive Vitamin K may cause severe anemia and brain damage."

"The Protectors"

Instructor: Our formation includes players who have shown us how the unborn child must be provided with good prenatal care and nutrition and some of the things that can happen if those protections are not there. Now let's add to the "formation" the things that the unborn child must be protected from.

Instructor: Play 14
Student: 23

Play # 14	Location of the Play: Sitting in a circle around the outside of the "placental ring".

The Play: "Toxoplasmosis is an amazingly prevelant infection from which the mother and father can protect the unborn child. One in every 1000 infants are infected with the protozoan, toxoplasmosis. Ten percent of those infants or approximately 300 babies a year in the U.S. are severely brain damaged from toxoplasmosis. They may also be blind, deaf, cerebral palsied and have seizures. Sometimes the disease does not manifest itself until an individual is in his or her 20's when the toxoplasmosis cysts rupture releasing thousands of parasites which attack the heart, eyes, internal organs and the central nervous system. To protect that unborn child the mother and father must:

1. Cook beef, pork and lamb until well done. Cysts of toxoplasma sometimes exist within the muscles of meat.
2. Wash their hands well after handling the pet cat or better yet have no cat in the house while expecting a child.
3. The mother should not empty cat litter boxes while pregnant. The spores passed in the feces of infected cats can be inhaled or ingested."

Instructor: The mother and father of an unborn infant must also protect their child from a world which uses thousands of chemicals and drugs. Harmful drugs and chemicals cause 3% of all mental retardation. The average pregnant woman takes 7 different drugs during pregnancy. The array of drugs found in the average person's medicine cabinet is potentially destructive to an unborn child. Drugs can be harmful to an unborn child in 3 ways:

1. Drugs may cause growing cells to deviate from their normal development.
2. The drug may effect the placenta reducing the flow of food and oxygen to the unborn child or may actually magnify the drug concentration to the child.
3. A drug can act on the liver and impair the handling of red blood cell breakdown by-products or directly separate bilirubin from blood proteins to which they are normally bound. Either way excessive bilirubin may build up depositing itself in the brain causing damage.

Instructor: Play 15
Student: 24

Play # 15	Location of the Play: Sitting in a circle around the outside of the "placental ring".
The Play: "The man and woman must consider every drug that a woman might take while pregnant as potentially dangerous. For example, Coumarin, used to treat blood clots may result in bleeding in the infant and subsequent brain damage. Heparin, also an anticoagulant does not cross the placenta so it would be an alternative choice in treatment."	

Instructor: Play 16
Student: 25

Play # 16	Location of the Play: Sitting in a circle around the outside of the "placental ring".
The Play: "The mother who takes diuretics may upset the unborn infant's water, salt and electrolyte balance resulting in brain damage. A special diet and rest may be more prudent treatment."	

Instructor: Play 17
Student: 26

Play # 17	Location of the Play: Sitting in a circle around the outside of the "placental ring".
The Play: "I'm streptomycin, an antibiotic used to treat infection in the mother. It may cause a severe hearing loss and I may also destroy the unborn child's balance mechanism. An alternative antibiotic might be penicillin which is relatively safe for the unborn child."	

Instructor: Play 18
Student: 27

Play # 18	Location of The Play: Sitting in a circle around the outside of the "placental ring".
The Play: "I am the common aspirin. I am in almost 80% of over the counter drugs and have widespread use for aches, pains and fever. I can cause bleeding under the skull of the unborn child resulting in brain damage, hemorrhaging during birth and even death. Sleep and relaxation or an alternative for fever recommended by the doctor protects the unborn child ."	

Instructor: The fact that a drug has been given in one case during pregnancy without serious side effects does not imply that it is safe for all unborn children. A great deal depends on the month, week, day, minute in which the drug was given, the amount taken, length of time the drug is taken, the genetic predisposition of the infant and how all these factors interact. Here is a chart of known or suspected risks of various drugs taken during pregnancy. (Prepared from dittos 50A through 53.) Go over the ?, +, ++, +++ and ++++ coding system.)

The mother and father must also protect their unborn child from chemicals that are routinely a part of our environment.

Instructor: Play 19
Student: 28

Play # 19	Location of The Play: Sitting in a circle around the outside of the "placental ring".
The Play: "I am a nitrate and I am being introduced into our environment at an ever increasing rate in fertilizers, herbicides, meat preservatives and color enhancers. Nitrates interfere with the delivery of oxygen to the cells and to the brain. A mother of an unborn child should: 1) avoid drinking water of a high nitrate concentration; 2) avoid excessive intake of beets, spinach, broccoli, celery, lettuce, radishes kale, mustard greens and collards which are high in nitrates, and 3) avoid excessive amounts of sausage, cured meats, ham, bacon and smoked fish products."	

Instructor: Play 20
Student: 29

<table>
<tr><td>Play #
20</td><td>Location of The Play: Sitting in a circle around the outside of the "placental ring".</td></tr>
<tr><td colspan="2">The Play: "I'm lead. A substance which the mother and father of an unborn child must avoid. Lead poisoning in man has long been recognized as a cause of stillbirths and malformations. An accumulation of blood lead levels in a pregnant woman can be transmitted across the placenta causing liver, kidney, heart and central nervous system damage and anemia. A pregnant woman should: 1) not paint while pregnant and most certainly not with lead base paint, 2) not use glazed pottery of dubious glazing standards for acid such as in citrous fruit and warm liquids can cause "seeping" of the lead in the glaze, 3) wash all fresh fruits and vegetables with soap and water and 4) keep cosmetic use to a minimum. Many contain lead, arsenic and mercury."</td></tr>
</table>

Instructor: Play 21
Student: 30

<table>
<tr><td>Play #
21</td><td>Location of The Play: Sitting in a circle around the outside of the "placental ring".</td></tr>
<tr><td colspan="2">The Play: Our homes abound in chemicals of all sorts which can be harmful to the unborn child. A few examples -
- Aerosols have flurocarban propellants. They are closely related to Halothane which have been indicated in birth defects.
- During pregnancy is not a time for the man or woman to paint the house. Paint and turpentine fumes should be avoided.
- Household cleaners can be absorbed through the skin. A pregnant woman should wear gloves and keep the area well ventilated while using "cleaners".
- Hair dyes are absorbed thru the skin as are cosmetics. They are questionable both in cancer causation and genetic damage."</td></tr>
</table>

Instructor: Play 22
Student: 31

<table>
<tr><td>Play #
22</td><td>Location of The Play: Sitting in a circle around the outside of the "placental ring".</td></tr>
<tr><td colspan="2">The Play: "I am radiation. The mother and father must protect the unborn child made up of rapidly dividing, nondifferentiated cells from the hazards of radiation. A smaller brain size than normal, water in the brain, open spine defects, cleft palate and retarded growth are but a few of the damages which can result from subjecting an unborn child to x-rays. A pregnant woman should: 1) have no dental x-rays, 2) have medical x-rays only if absolutely necessary and then only with appropriate lead shielding of the baby, 3) not work in a job which exposes or risks exposing the unborn child to x-rays and 4) have x-rays of the pelvic area only very close to delivery if it is necessary for a decision about the birth process."</td></tr>
</table>

Instructor: WOW! You did a great job of teaching, acting, etc.! Do you get the picture? What does the formation represent? Right. You now have two rings: one of providers encircling the unborn child and another ring outside the placental ring of threats from which the unborn child must be protected.

It is a lot to manage, a tremendous responsibility. While the mother and father are managing all of this they must be planning for the time when the baby must make that transition from the inside to the outside world. To participate in the birth process and thus enable the infant in transition to have the optimum amount of oxygen during a most critical time of life a mother and father must be prepared. They must prepare and plan for the event months in advance with special breathing and muscle exercises. They must learn what labor and delivery involve. A prepared parenthood course in a mother and father's area can be located by contacting:

The American Society for Psychoprophylaxis
in Obstetrics
7 West 96th Street
New York, New York 10025

Even if the mother and father are prepared the woman and unborn child should be under the care of an obstetrician for prenatal care.

If a nurse-midwife who is a graduate nurse with 2 years of special postgraduate study in obstetrics is to deliver the baby at home the obstetrician should still be on call to assist in the birth if complications should arise.

The planning, the protecting and the providing during the 266 days answers the unborn child's call for help, nutrients, oxygen and protection from everything harmful. The chances that she or he will be born whole, healthy and strong are good.

☐ **Classroom Experience Options**

General

1. Use pamphlets for discussion, clarification or emphasis:
    a. Your Head Is Your Own Thing But Don't Blow Your Kids Mind ⬡ #24
    b. It Can Happen To Anyone ⬡ #24
    c. Caring For Your Unborn Child ⬡ #24
    d. Take Care of Yourself ⬡ #24
    e. Be Good To Your Baby Before It Is Born (Also In Spanish) ⬡ #20
    f. Confidential To Fathers To Be ⬡ #20
    g. Alert Bulletin 29 ⬡ #20
    h. If You Really Want To Improve Your Environment Start At The Beginning ⬡ #20
    i. Approaching Adulthood ⬡ # 6
    j. A Story About You ⬡ # 6
    k. Facts Aren't Enough ⬡ # 6
    l. Parent's Responsibility ⬡ # 6
    m. How A Mother Affects Her Unborn Baby ⬡ # 5
2. Show a film as an introduction or extension of this area of study:

a. More Than Love

Time: 18 min. color filmstrip junior/senior high school
Content: Reveals the miracle [illegible] growth of life during its first 40 days. Advises [illegible]ific cautionary actions for the first three months and offers do's and don'ts for the entire 9 months. Emphasizes good prenatal care.
Available from: ⊛ #20

b. Exploring Inner Space

Time: 21 min. color film junior/senior high school
Content: The March of Dimes explores pioneering the frontiers of perinatal health. A sample of recent volunteer activities, research and medical advances. Illustrates Riley Hospital in depth.
Available from: ⊛ #20

c. Have A Healthy Baby HSC-868

Time: 19 min. color film senior high school
Content: Points out the importance of proper prenatal care prior to delivery of a baby and uses the statistical realities of childbirth for emphasis. Stresses the need for prenatal care, proper diet and the danger of drug use when pregnant. Illustrates the developmental processes in the embryo and later in the fetus.
Available from: ⊛ #11 Rental: $9.25

d. Mental Retardation: Gestational Disorders

Time: 15 min. color filmstrip and cassette junior/senior high school
Content: Identifies the cause of gestational disorders and preventive measures which have been developed to combat some of these disorders. Develops a humanistic approach toward working with the mentally retarded.
Available from: ⊛ #9

e. The Beginning of Pregnancy HS-637

Time: 29 min. Black and white film senior high school
Content: Describes what happens to the mother and baby during the early months of pregnancy. Shows process of fertilization, movement of fertilized ovum to the uterus and the implantation. Explains how characteristics are inherited and how twins are produced.
Available from: ⊛ #11 Rental: $9.50

f. The First Visit To The Doctor HS-638

Time: 29 min. black and white film senior high school
Content: Discusses the initial visit to the doctor after

pregnancy is suspected. Indicates physiological changes of pregnancy, procedures in the doctor's office, including a step-by-step description of the pelvic examination.
Available from: ⊛ #11 Rental: $9.50

g. The Middle Months of Pregnancy HS-640

Time: 29 min. black and white film senior high school
Content: Discusses such topics as superstitions about birth marks and deformities, how to relieve morning sickness, changes in clothing, how to relax and rest and suggestions for relieving constipation, shortness of breath and dizziness as they effect the expectant mother.
Available from: ⊛ #11 Rental: $9.50

h. The Last Months of Pregnancy HS-641

Time: 29 min. black and white film senior high school
Content: Discusses fetal development during the later months before birth and gives many suggestions for the care and well being of the expectant mother. Demonstrates an exercise for mothers that helps avoid backache and recommends walking as being desirable.
Available from: ⊛ #11 Rental: $9.50

Prenatal Care

1. Use pamphlets for summary or emphasis:
   a. Prenatal Care DHEW (OCD) 75-17 ⬡ #5
   b. Prenatal Care ⬡ #6
2. Show a film for clarification or motivation:
   a. The Choice
   Time: 5 min. color film junior/senior high school
   Content: The potential advantages of good prenatal care are contrasted with the dangers of neglect and ignorance where expert medical supervision is concerned.
   Available from: ⊛ #14

b. Prenatal Care HS-457
Time: 21 min. black and white film senior high school
Content: Diagrams show the female organs and the changes that take place during pregnancy. Emphasizes the fact that prospective mothers should work with the doctor and her husband in planning diet, exercise and clothing. Diagrams show the development of the embryo.
Available from: ⊛ #11 Rental: $7.50

c. Nine Months To Get Ready P-82
Time: 25 min. color film junior/senior high school
Content: The importance of prenatal care and an explanation of what it involves is the message in this film. This is the story of a young mother who delivered her first baby prematurely because of toxemia. For the second pregnancy she seeks prenatal care and avoids complications. The reasons and nature of prenatal care are given as we follow her through the initial visit to clinic, examinations and laboratory tests, instructions in diet, weight control and regular check-ups.
Available from: ⊛ #10

d. Prenatal And Postnatal Care P-112
Time: 29 min. color film junior/senior high school
Content: An introduction to a class in prenatal care, a class for expectant couples and a well-baby clinic. Introduces individuals to the advantage of proper prenatal and post natal care.
Available from: ⊛ #10

e. Mr. and Mrs. Maternity P-84
Time: 22 min. color film junior/senior high school
Content: Provides a basis for understanding the physiological events of normal pregnancy, labor and delivery. Made by 4 O.B-Gyn's and a psychologist.
Available from: ⊛ #10

3. Discuss in small groups what makes a person go back to one doctor versus another.
4. Have a debate with two students arguing for prenatal care and two against.
5. Role Play: A father trying to get the mother of his child to seek prenatal care. She is very resistive.
6. Speakers:
    a. An obstetrician to talk on the importance of the high risk parent concept.
    b. A nurse to speak on the importance of prenatal care.
    c. Two young parents to tell of their experiences in prenatal care.
    d. A young mother who has had no prenatal care to share her experiences.

Nutrition

1. Pamphlets for discussion:
    a. Nutrition and Pregnancy ⬡ #24
    b. Proper Nutrition For Your Unborn Baby ⬡ #24
2. Movies for a more in depth understanding of the role of nutrition:
    a. Inside My Mom

       Time: 7:45 min. color filmstrip or slides with cassette junior/senior high school
       Content: Concise but light in tone this film shows the role good eating habits play in future growth and development and also during pregnancy. Combining cartoon animation and live action it offers sound nutritional advice in an informal manner.
       Available from: ⊛ #14

    b. Healthy Mother, Healthy Baby

       Time: 16 min. color film junior high school
       Content: A comprehensive film on nutrition and pregnancy; includes guidelines for good prenatal nutrition and reasons why this is important for all expectant mothers, including the pregnant teenager. Also cautions on the use of alcohol, cigarettes and medication.
       Available from: ⊛ #13

    c. Great Expectations

       Time: 22 min. color film junior/senior high school
       Content: Explains the benefits of good maternal nutrition during pregnancy and breast feeding. The healthy mothers and infants that it portrays are compelling evidence of the role that good nutrition plays in the fulfillment of the joy and vitality of motherhood.
       Available from: ⊛ #13

    d. The Unfinished Child

       Time: 26 min. color film junior/senior high school
       Content: A study of prenatal and infant malnutrition. Explaining proper diet for mother and infant.
       Available from: ⊛ #14

3. Look at a human cell under the microscope. Discuss its parts and its "nutrition".
4. Display a sample "day's menu" for the pregnant women as given in the teacher's background material.
5. Make a collage of malnourished mothers, fathers and infants and one of well nourished mothers, fathers and infants.
6. Speaker: Have a dietician talk on vitamin abuse.

Infections, Diseases, Drugs, Chemicals

1. Use pamphlets for a summary or discussion:
    a. Protecting Your Unborn Children From Rh Disease ⬡ # 24
    b. Venereal Disease ⬡ # 6
    c. Protecting Your Unborn Baby From Infections ⬡ # 24

   - d. When You Drink, Your Baby Does Too ⬡ #20
   - e. DATA* Drugs* Alcohol* Tobacco Abuse During Pregnancy ⬡ #20
   - f. Medicines Can Harm Your Unborn Baby ⬡ #24

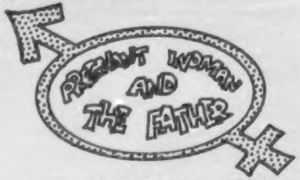
2. Write to the Indiana State Board of Health to inquire as to how or if they keep track of infectious diseases such as toxoplasmosis, venereal diseases, Rubella, and Rh incompatability problems.
3. Write the Indiana State Board of Health and several state legislators to see if there are laws which protect the public from lead base paint, pottery glazes, mercury and fungicides.
4. Write the Center for Disease Control in Atlanta, Georgia for recommendations on flu immunization for pregnant women.
5. Look for pictures of the toxoplasma gondi sporozoan in biology books and make drawings of it.
6. Brain storm for all the animals that students can think of which may eat mice.

Outside Classroom Activity Options

1. Survey hospitals as to what precautions they routinely take in x-raying women. Do they ask if a woman is pregnant? Do they test for pregnancy? Do they use lead aprons?
2. Survey dentists for the same information as in #1.
3. Tour a prenatal clinic.
4. Compare the costs of caring for a mentally retarded child for 9 months in an institution with the cost of prenatal care for 9 months.
5. Survey the community to see what community agencies give free or inexpensive prenatal care. How are they funded?
6. Investigate to see if expectant and/or planned parenthood classes are offered in your community. Do people from all economic levels attend? What is the cost?
7. Call the Board of Health in your area to see if they have any information on the nitrate content of your drinking water.
8. Survey sausage, cured meat, ham, bacon and smoked fish in your grocery stores to see what information the labels give as to the nitrate content.
9. Poll a number of new mothers as to when they began prenatal care and why they did (or didn't).
10. Determine if any adults in your family would fall in a high-risk-potential-parent category.
11. Have students tabulate all the medicines in their home medicine cabinets according to whether they are prescription or nonprescription plus their names. Look up their rating on the GOTS Chart given in the teacher's background material and also on a ditto for this area of study.
12. Check with Board of Health and state legislators regarding lead base paint laws.
13. Contact the O'Brien Paint Company in South Bend to see if they will give you any information on the content of their paints. They were sued for suspected lead caused mental retardation to an unborn child.
14. Have students bring in or tabulate all the glazed pottery they have in their homes.
15. Check paint can labels for possible lead base content in local paint stores or paint departments.
16. Have volunteers have their blood checked for lead content.

Action Checklist

Pass out an Action Checklist to each student prepared from ditto 54. Use as a summary of the responsibilities of the pregnant woman and the man towards the prevention of mental retardation in the next generation.



____ As a father of an unborn child I will encourage, motivate and make it physically and mentally conducive for the mother of my child to carry out the actions that follow.

____ Give up smoking, drinking and social drug use.

____ Have surgical repair of the cervix early in pregnancy if necessary.

____ Be tested and treated for venereal disease if the possibility of infection exists.

____ Not be immunized against Rubella.

____ If an Rh- mother carrying and Rh+ infant have medical monitoring of antibody buildup to make a decision about intra uterine transfusion, optimum delivery time and/or transfusion after birth.

____ Have prenatal care for my unborn baby and myself, and inform the doctor of any high risk factors of myself, the father or family.

____ Eat meals which supply the unborn child with the optimal calories, protein and nutrients needed for fantastic growth and development.

____ Take vitamins only under a doctor's direction and in quantities not exceeding recommended daily allowances.

____ Gain from 22 to 30 pounds.

____ Cook all meat well done.

____ Avoid contact with cat excretion.

____ Take prescription drugs only as prescribed by a doctor who seriously considers pregnancy "in prescribing".

____ Not take over-the-counter drugs.

____ Not drink water of a high nitrate concentration.

____ Avoid eating excessive amounts of:
    beets
    spinach
    broccoli
    celery
    lettuce
    radishes
    kale
    mustard greens
    collards
    sausage
    cured meats
    ham
    bacon
    smoked fish products

____ Not paint while pregnant or inhale paint and turpentine fumes.

____ Not use glazed pottery of dubious quality.

____ Wash all fresh fruits and vegetables with soap and water.

____ When using household cleaners wear gloves and have adequate ventilation.

____ Keep cosmetic use to a minimum.

____ Have no dental x-rays.

____ Have medical x-rays only if absolutely necessary and then with a lead apron protection of the baby.

____ Have pelvic x-rays only very close to birth if necessary for birth process decisions.

____ Take planned parenthood classes to prepare for childbirth.

Post Test

Use the same test as for the pre test. Have the students take it in class or as homework. Let them compare their gains.

Action Checklist Review

Action To Be Taken Before Pregnancy	Possible Action When Expectant Parents
I want to:	
- Learn as a potential parent how I can specifically take action to prevent mental retardation or lessen the probability that I will have a handicapped child.	Learn as a parent how I can specifically take action to prevent mental retardation or lessen the probability that my child will be handicapped.
- Limit the childbearing years from 20 to 35 years of age.	
- Be sexually responsible.	
- Avoid venereal disease.	Avoid venereal disease.
- Be tested for venereal disease if infection is a possibility and obtain treatment if necessary.	Be tested for venereal disease and obtain treatment if infected.
- Be immunized against Rubella.	Avoid immunization.
- Eat foods that provide a diet adequate in calories and nutrients.	Eat foods that provide adequate calories, protein and nutrients.
- Be in control of your own life in relation to drugs, self medication, alcohol and smoking.	
- Avoid excessive or unnecessary x-rays for medical and dental diagnosis and treatment.	Do not have dental x-rays.
- Request proper shielding of the sex organs when being x-rayed. (particularly males!)	Do not have therapeutic or diagnostic x-rays unless absolutely necessary and then only with lead shielding.

Action Checklist Review
(contined)

Action To Be Taken Before Pregnancy	Possible Action When Expectant Parents
- (Girls only!) Request a pregnancy test before being x-rayed if there is any possibility of pregnancy.	
- (Girls only!) Obtain regular cervical examinations by a gynecologist if involved in frequent sexual intercourse in the young teenage years.	Have surgical repair of the cervix.
- Keep my own medical record covering at least three generations if possible.	
- Determine if I am genetically a high risk potential parent.	
- Receive genetic counseling before bearing children if I am a high risk parent.	
- Consider whether I am a "high or low risk" potential parent in relation to drugs, infection, disease and testing for infection and disease.	Consider if you are a high risk parent or carry a high risk child.
- Modify or stop smoking when planning for a child.	Stop smoking.
- Modify or stop drinking when planning for a child.	Stop drinking.
- Modify or stop social drug use when planning for a child.	Stop drug use.
- Stop using the pill well before pregnancy if I am on it. (Girls only!)	

Ditto 40
V. The Pregnant Woman and The Man (continued)

Action Checklist Review
(continued)

Action To Be Taken Before Pregnancy	Possible Action When Expectant Parents
- Be tested for: Rubella antibodies, RH factor, T.B. and venereal disease.	Monitor Rh antibody buildup to allow for transfusion of the unborn baby or selection of an optimal delivery date.
- Consult with a doctor about any disease or special condition I have and also consider drug modification or change.	Consult with a doctor about any disease or special condition I have and also consider drug modification or change.
- Request a transfer or change jobs if any chemicals or drugs at my place of work are potentially dangerous to me or my unborn child while planning for a child.	Request a transfer or change jobs if any chemicals or drugs at my place of work are dangerous to my unborn child.
- Space children (pregnancies) at least two years apart.	
- Conceive a child at the optimum time of fertilization.	

V. The Pregnant Woman and The Man

Ditto 41

Play # 1	Location of the Play: Sitting in the middle of the floor.
The Play: "I am an unborn child starting my 266 days of growth from one cell to billions of cells. My first three months of life are very vulnerable. Things that can happen to me in the first three months of life account for 35% of all mental retardation. The quality of these 266 days of unborn life determine the quality of my entire life."	

Play # 2	Location of the Play: Sitting in a large circle around Player 1.
The Play: "We are the placenta through which all things must pass to the unborn child. People use to think that I protected the unborn child from everything harmful. Actually I let not only good things in from the outside world but also the bad. My blood and that of the baby do not mix but come so close that I let oxygen, nutrients and some drugs, antibodies, some disease and some infections into the baby."	

Play # 3	Location of the Play: Still sitting in the center of the room.
The Play: "Give me all the food and oxygen that I need to live and grow. Protect me from everything harmful. Listen to me if I call for help. Get me help if I need it. Plan for the day when I choose to be born. I will need a great deal of help. I want to be born whole, healthy and strong. Help me!"	

V. The Pregnant Woman and The Man

Ditto 42

Play # 4

Location of the Play: Pass through the large circle and sit in a circle around Player I.

The Play: "I am medical care often called prenatal care. I came as soon as I knew you started your growth. 350,000 babies a year are born without me. As many as 1/3 of all pregnant women and the fathers do not seek medical care. If they all did mental retardation could be reduced by a whopping 10%. It seems so easy. I can help your mother and father recognize specific high risks which may effect you. Here are the high risk factors which everyone should know if they are involved in this formation. (Instructor passes out the high risk cards to everyone prepared from ditto 50.) Mental retardation can be reduced or prevented if a woman and man fit into one or more of these categories are absolutely sure that they seek good prenatal care and that the doctor knows specifically of his and/or her risk potential. Good prenatal care can make a difference in the outcome of most high risk pregnancies."

Play # 5

Location of the Play: Pass through the large circle and sit in a circle around Player I

The Play: "I am breech birth. Prenatal care can locate the position, size and structure of the fetus in the womb using an ultrasound machine and plan for breech births, multiple births and even a child of defective structure."

Play # 6

Location of the Play: Pass through the large circle and sit in a circle around Player I

The Play: "I am fetal distress. Using a urine test which is a routine part of prenatal care the doctor can determine if the unborn child is in distress and then plan delivery at the best possible time."

V. The Pregnant Woman & The Man Ditto 50

Various High Risk Factors for Parents Planning For a Child.

I. Preconception	II. Previous Pregnancies	III. Early Pregnancy	IV. Late Pregnancy	V. Labor and Development	VI. Newborn
Family genetic, or central nervous system disorders	Infant with a genetic disorder	* COLUMN	Unwanted	Premature labor	Less than 35 week gestation
Intermarrying	Infant with a birth defect	I	Uterine bleeding	Induction of labor	Birthweight less than 2,000 grams
Low socio-economic status	Premature or small for birth infant	COULD BE	Toxemia	Obstruction of birth canal	Respiratory distress
Excessive radiation exposure	Excessively large infant	HERE	Excessive amnionic fluid	Fetus and pelvic disproportion	Seizures
Nutritional abnormality	Caesarean section	FOR A MAN	Obstruction caused by a clot	Fetal distress	Infection
Under 15 or over 40	Difficult childbirth	AND	Growth too small or large for date	Poor Progress in labor	Congenital defects
Incompetent cervix	Stillbirth or newborn death	WOMAN	Abnormal position	Abnormal position for birth	Vomiting of elimination swallowed before birth
Abnormal genital tract	Abortion or abortions	WHO DO NOT	Past due	Abnormal bleeding	Excess acid accumulation or loss of bases
High blood pressure	Special care needed for newborn	PLAN	Rupture of membrane for more than 12 hours without labor	Operative delivery	Elevated blood sugar
Under or over-active thyroid	Severe emotional problems during pregnancy and delivery	FOR A	Evidence of infection	Infection of the placenta	Elevated breakdown products of red blood cells
Heart disease	Excessive vomiting	CHILD*		Mis-positioning of the placenta	
Kidney disease				Tissue in the amnionic fluid	

V. The Pregnant Woman & The Man Ditto 50

Various High Risk Factors for Parents Planning for a Child. (continued)

I. Preconception	II. Previous Pregnancies	III. Early Pregnancy	IV. Late Pregnancy	V. Labor and Development	VI. Newborn
Diabetes Cancer Anemia Rh incompatibility Exposure to harmful drugs or chemicals Harmful drug intake Lack of rubella immunization Syphilis Tuberculosis Hepatitis PKU mother Children closely spaced					Lack of oxygen Rh disease

V. The Pregnant Woman and The Man

Ditto 43

<table>
<tr><td>Play #
7</td><td>Location of the Play: Pass through the large circle and sit in a circle around Player #1.</td></tr>
<tr><td colspan="2">The Play: "Toxemia is rather common in pregnant women. It is characterized by high blood pressure, rapid weight gain, swelling ankles and protein in the urine. It can be controlled and even prevented by good prenatal care. If toxemia is not controlled it can cause convulsions, prematurity and mental and physical handicaps in that unborn infant."</td></tr>
</table>

<table>
<tr><td>Play #
8</td><td>Location of the Play: Pass through the large circle and sit in a circle around Player #1.</td></tr>
<tr><td colspan="2">The Play: "Another point for prenatal care. If the pelvis of the mother is too small for the size of the infant the head can ram against the pelvic floor during labor and also deprive the baby of oxygen because birth is delayed. During prenatal care the size of the pelvis in relation to the size of the baby can be determined and a caesarean section planned if necessary."</td></tr>
</table>

<table>
<tr><td>Play #
9</td><td>Location of the Play: Pass through the large circle and sit in a circle around Player #1.</td></tr>
<tr><td colspan="2">The Play: "Quite often, one in every 200 pregnancies, the placenta does not position itself properly in the uterus and when stretched thinly in places during the last months of pregnancy it may tear away from the uterus wall early or obstruct the birth canal. This can result in a lack of oxygen to the infant and subsequent brain damage. If a mother has good prenatal care labor can be induced or the baby delivered by caesarean section to avoid oxygen deprivation if this placenta problem develops."</td></tr>
</table>

<table>
<tr><td>Play #
10</td><td>Location of the Play: Pass through the large circle and sit in a circle around Player #1.</td></tr>
<tr><td colspan="2">The Play: "I am a flu epidemic! If such an epidemic threatens sometime during the 9 months of pregnancy a doctor may suggest vaccination with a "flu shot" with a type recommended for pregnant women from the Center for Disease Control in Atlanta, Georgia. Influenza can cause a number of birth defects in the unborn child."</td></tr>
</table>

V. The Pregnant Woman and The Man

Ditto 44

Play # 11	Location of the Play: Pass through the large circle and sit in a circle around Player #1.

The Play: "I am good nutrition
adequate protein
adequate calories
vitamins and minerals
during pregnancy. For the brain and body to grow properly and optimally it is important that the best conditions possible for nourishment be provided at this time by the mother and father of the unborn child. I brought you some brain cells. (Instructor flashes the brain cell transparency prepared from transparency 41 on the wall on a screen.) During rapid growth the cells are increasing in size as well as number. Their protective covering is also being formed to safeguard the central nervous system from insult and trauma. The enzyme systems within each cell are being laid down.

The time of rapid brain growth is 6 months before and 6 months after birth. A child born to a severely malnourished mother may catch up to a great extent in physical growth with an adequate diet but impairment of the central nervous system may be irreversible and leave the individual permanently damaged with respect to intellectual functioning. Optimal nutrition can lessen the likelihood of prematurity and toxemia and provide greater reserves to deal with infection and hemorrhaging."

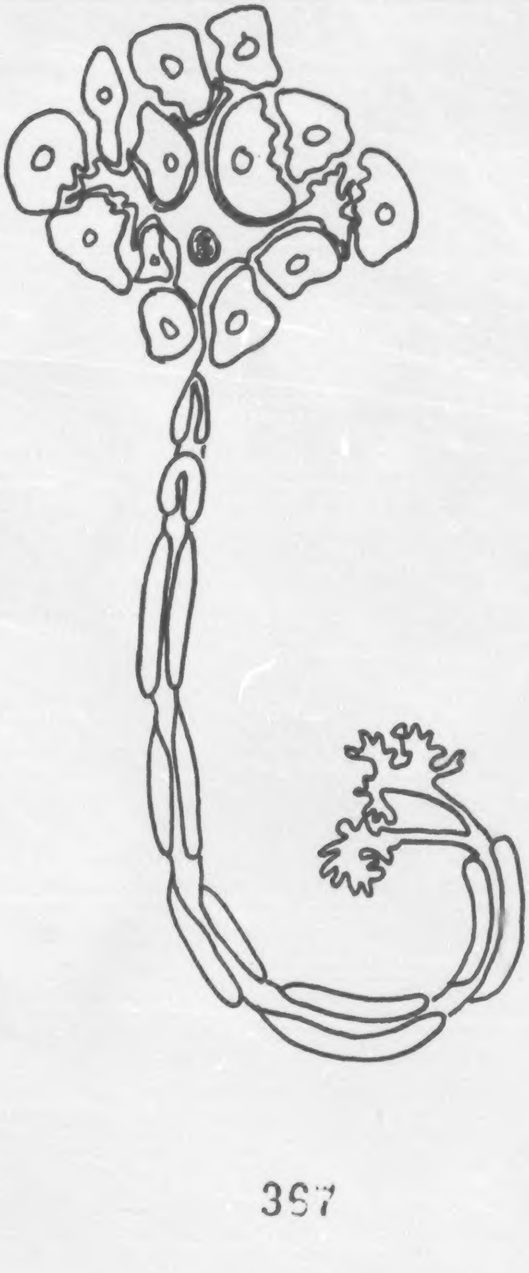
Play # 12	Location of the Play: Pass through the large circle and sit in a circle around Player #1.

The Play: "I am weight gain. If you are going to be born at full size your mother should gain from 22 to 30 pounds. Years ago before milk was fortified with vitamin D women had narrow pelvises and doctors advised keeping weight down during pregnancy to keep the baby small enough to pass through a relatively small pelvis. We know now that women who gain less than 15 to 20 pounds are unlikely to have low birth weight babies. So a pregnant woman should consume about 2400 calories a day with plenty of protein as a part of those calories."

V. The Pregnant Woman and The Man

Transparency 41

Brain Cell



V. The Pregnant Woman and The Man

Ditto 45

Play # 13	Location of the Play: Pass through the large circle and sit in a circle around Player #1.

The Play: "The unborn child will need vitamins and minerals. Iron and folic acid should probably be supplemented under the doctor's supervision. Iron is needed for hemoglobin which transports oxygen to the cells. Folicin is necessary for optimum placental function as is sodium. (Walk to the circle outside of the "placental circle".) However, vitamins taken in excessive amounts can result in toxic and dependent states. The overzealous use of vitamins and minerals is risky for the unborn child. In excess they become chemicals which must be stored, disposed of or built up in inappropriate places within the body. For example:

Excessive Vitamin A can cause mental retardation.
Excessive Vitamin D can damage major blood vessels.
Excessive Vitamin C can cause dependency states.
Excessive Vitamin B_6 can lead to repeated and prolonged convulsions in the infant and subsequent brain damage.
Excessive Iron can cause neonatal jaundice.
Excessive Vitamin K may cause severe anemia and brain damage."

V. The Pregnant Woman and The Man

Ditto 46

Play # 14	Location of the Play: Sitting in a circle around the outside of the "placental ring".

The Play: "Toxoplasmosis is an amazingly prevelant infection from which the mother and father can protect the unborn child. One in every 1000 infants are infected with the protozoan, toxoplasmosis. Ten percent of those infants or approximately 300 babies a year in the U.S. are severely brain damaged from toxoplasmosis. They may also be blind, deaf, cerebral palsied and have seizures. Sometimes the disease does not manifest itself until an individual is in his or her 20's when the toxoplasmosis cysts rupture releasing thousands of parasites which attack the heart, eyes, internal organs and the central nervous system. To protect that unborn child the mother and father must:

1. Cook beef, pork and lamb until well done. Cysts of toxoplasma sometimes exist within the muscles of meat.
2. Wash their hands well after handling the pet cat or better yet have no cat in the house while expecting a child.
3. The mother should not empty cat litter boxes while pregnant. The spores passed in the feces of infected cats can be inhaled or ingested."

Play # 15	Location of the Play: Sitting in a circle around the outside of the "placental ring".

The Play: "The man and woman must consider every drug that a woman might take while pregnant as potentially dangerous. For example, Coumarin, used to treat blood clots may result in bleeding in the infant and subsequent brain damage. Heparin, also an anticoagulant does not cross the placenta so it would be an alternative choice in treatment."

Play # 16	Location of the Play: Sitting in a circle around the outside of the "placental ring".

The Play: "The mother taking a diuretic may upset the unborn infant's water, salt and electrolyte balance resulting in brain damage. A special diet and rest may be more prudent treatment."

V. The Pregnant Woman and The Man

Ditto 47

<table>
<tr><td>Play #
17</td><td>Location of the Play: Sitting in a circle around the outside of the "placental ring".</td></tr>
<tr><td colspan="2">The Play: "I'm streptomycin, an antibiotic used to treat infection in the mother. I may cause a severe hearing loss and I may also destroy the unborn child's balance mechanism. An alternative antibiotic might be penicillin which is relatively safe for the unborn child."</td></tr>
</table>

<table>
<tr><td>Play #
18</td><td>Location of the Play: Sitting in a circle around the outside of the "placental ring".</td></tr>
<tr><td colspan="2">The Play: "I am the common aspirin. I am in almost 80% of over the counter drugs and have widespread use for aches, pains and fever. I can cause bleeding under the skull of the unborn child resulting in brain damage, hemorrhaging during birth and even death. Sleep and relaxation or an alternative for fever recommended by the doctor protects the unborn child against these very damaging responsibilities."</td></tr>
</table>

<table>
<tr><td>Play #
19</td><td>Location of the Play: Sitting in a circle around the outside of the "placental ring".</td></tr>
<tr><td colspan="2">The Play: "I am a nitrate and I am being introduced into our environment at an ever increasing rate in fertilizers, herbicides, meat preservatives and color enhancers. Nitrates interfere with the delivery of oxygen to the cells and to the brain. A mother of an unborn child should: 1) avoid drinking water of a high nitrate concentration; 2) avoid excessive intake of beets, spinach, broccoli, celery, lettuce, radishes, kale, mustard greens and collards which are high in nitrates, and 3) avoid excessive amounts of sausage, cured meats, ham, bacon and smoked fish products."</td></tr>
</table>

V. The Pregnant Woman and The Man

Ditto 48

Play # 20	Location of the Play: Sitting in a circle around the outside of the "placental ring".

The Play: "I'm lead. A substance which the mother and father of an unborn child must avoid. Lead poisoning in man has long been recognized as a cause of stillbirths and malformations. An accumulation of blood lead levels in a pregnant woman can be transmitted across the placenta causing liver, kidney, heart and central nervous system damage and anemia. A pregnant woman should: 1) not paint while pregnant and most certainly not with lead base paint, 2) not use glazed pottery of dubious glazing standards for acid such as in citrous fruit and warm liquids can cause "seeping" of the lead in the glaze, 3) wash all fresh fruits and vegetables with soap and water and 4) keep cosmetic use to a minimum. Many contain lead, arsenic and mercury."

Play # 21	Location of the Play: Sitting in a circle around the outside of the "placental ring".

The Play: Our homes abound in chemicals of all sorts which can be harmful to the unborn child. A few examples -

- Aerosols have fluorocarbon propellants. They are closely related to Halothane which have been indicated in birth defects.
- During pregnancy is not a time for the man or woman to paint the house. Paint and turpentine fumes should be avoided.
- Household cleaners can be absorbed through the skin. A pregnant woman should wear gloves and keep the area well ventilated while using "cleaners".
- Hair dyes are absorbed thru the skin as are cosmetics. They are questionable both in cancer causation and genetic damage."

V. The Pregnant Woman and The Man

Ditto 49

<table>
<tr><td>Play #
22</td><td>Location of the Play: Sitting in a circle around the outside of the "placental ring".</td></tr>
<tr><td colspan="2">The Play: "I am radiation. The mother and father must protect the unborn child made up of rapidly dividing, nondifferentiated cells from the hazards of radiation. A smaller brain size than normal, water in the brain, open spine defects, cleft palate and retarded growth are but a few of the damages which can result from subjecting an unborn child to x-rays. A pregnant woman should: 1) have no dental x-rays, 2) have medical x-rays only if absolutely necessary and then only with appropriate lead shielding of the baby, 3) not work in a job which exposes or risks exposing the unborn child to x-rays and 4) have x-rays of the pelvic area only very close to delivery if it is necessary for a decision about the birth process."</td></tr>
</table>

Ditto 50A

V. The Pregnant Woman and The Man

KNOWN OR SUSPECTED RISKS OF VARIOUS DRUGS TAKEN DURING PREGNANCY

Legend-

?	The drug has not been sufficiently well studied to date to allow useful or accurate recommendations. If possible avoid these, particularly during the first trimester.
+	Some studies have been performed and no serious fetal consequences have yet been identified. This doesn't mean the drug is safe. It merely means that it may be relatively safe.
++	Some studies or theoretical considerations suggest possible hazards to the fetus or embryo.
+++	Means that the drug or related drugs are probably risky. In some cases this assessment is based on hard laboratory data; in others it is supported by strong theoretical likelihood.
++++	Some studies have conclusively demonstrated hazards to the fetus or embryo.

	First Trimester	Second Trimester	Third Trimester
Acetaminophen	?	?	?
Adrenal cortex hormones	++	+	+
Alcohol (small)	+	+	+
Alcohol (large)	++++	++++	++++
Alka-Seltzer	+++	+++	+++
Allerest	?	?	?
Aluminum Hydroxide	++	+	+
Aminophylline	?	?	?
Amphetamines	+++	++	++
Anacin	+++	++	++
Aspirin	+++	++	++
ARM	?	?	?
Barbiturates (small)	+	+	+
Barbiturates (large)	+	+	+
Belladonnas	+	+	+
Bendectine	+	+	+
Birth Control Pills	++	++	++
Bonine	++	+	+
Bufferin	+++	++	++
Caffeine	++	++	++
Cephaloridine	++	++	++
Cephalothin	+	+	+
Chloramphenicol	++	++	+++
Chlorothiazide	++	++	+++
Chlorpheniramine	?	?	?
Codeine (small)	+	+	+
Codeine (large)	+++	+++	++++
Compoz	?	?	?
Contac	?	?	?
Coricidin	++	++	++

Ditto 51

V. The Pregnant Woman and The Man

	First Trimester	Second Trimester	Third Trimester
Coumarin	+++	++	+++
Cyclizine	++	+	+
Cyclopropane	++	+	+
Darvon	++	+	+
Darvon Compound	+++	++	++
Datril	?	?	?
Demerol (small)	+	+	+
Demerol (large)	+++	+++	++++
Dextromethorphan	?	?	?
Diazepam	+++	++	++
Diethylstilbestrol	++++	++	+
Dilantin	+++	+	+
Diphenhydramine	+++	++	+
Dimenhydrinate	+	+	+
Doans Pills	+++	++	++
Dristan	+++	++	++
Empirin	+++	++	++
Ephedrine	?	?	?
Equanil	+++	++	++
Erythromycin	+	+	+
Ethacrinic Acid	++	++	+++
Excedrin	+++	++	++
Ex-lax	+	+	+
Flagyl	+++	++	++
Folic Acid	++	+	+
4-Way Cold Tablets	+++	++	++
Durosemide	++	++	+++
Gentamycin	+++	+++	+++
Gelusil	++	+	+
Geritol	++	+	+
Halothane	++	+	+
Heparin	+	+	+
Heroin (large)	+++	+++	++++
Hydralazine	+	+	+
Hydrochlorothiazide	++	++	+++
Hydroxyzine	+	+	+
Influenza Vaccine	++	+	+
Insulin	+	+	+
Iodides	+++	+++	+++
Isoproterenol	++	++	++
Kanamycin	+++	+++	+++
Kaopectate	+	+	+
Librium	+++	++	++
LSD	+	+	+
Maalox	++	+	+
Magnesium Hydroxide	++	+	+
Marazine	++	+	+

Ditto 52

V. The Pregnant Woman and The Man

	First Trimester	Second Trimester	Third Trimester
Marijuana	?	?	?
Meclizine	++	+	+
Meprobamate	+++	++	++
Methotrexate	++++	+++	+++
Methyldopa	+	+	+
Methylphenidate	?	?	?
Metronidazole	+++	++	++
Miltown	+++	++	++
Morphine (small)	+	+	+
Morphine (large)	+++	+++	++++
Nitrofurantoins	+	+	+
Nitrous Oxide	+	+	+
Nytol	?	?	?
Ny Quil	?	?	?
Paregoric	+	+	+
Penicillin	+	+	+
Pentazocine	?	?	?
Percodan (small)	+++	++	++
Percodan (large)	+++	+++	++++
Phenacetin	?	?	?
Pheniramine	?	?	?
Phenobarbital	+++	++	++
Phenteramine	?	?	?
Phenylephrine	?	?	?
Phenylpropanolamine	?	?	?
Preparation H	+	+	+
Promethazine	++	+	+
Propoxyphene	++	+	+
Pyridoxine	+	+	+
Pyrilamine	?	?	?
Quinine	+++	+++	+++
Reserpine	+	+	+
Robitussin	?	?	?
Sinarest	?	?	?
Sine Off	+++	++	++
Sine-Aid	+++	++	++
Sinutab	?	?	?
Sleep-Eze	?	?	?
Sominex	+++	++	++
Sodium Bicarbonate	++	++	++
Talwin	?	?	?
Tetracyclines	+	+++	+++
Theophylline	?	?	?
Tigan	+++	++	+
Tolbutamide	+++	+++	+++
Tricyclic Antidepressants	++	+	+
Trimethobenzamide	+++	++	+

V. The Pregnant Woman and The Man

	First Trimester	Second Trimester	Third Trimester
Tripelennamine	?	?	?
Tylenol	?	?	?
Vitamin A*	+++	+++	+++
Vitamin B's	+	+	+
Vitamin C	?	?	?
Vitamin D	+++	++	++
Vitamin E	++	+	+
Vitamin K	+	+	+++
Valium	+++	++	++
Vanquish	+++	++	++

Notes -

1. The notations ?, +, +++, ++++ indicate that we know about the hazards, but they don't indicate how great the hazards actually are. In other words, all drugs with ++++ are known to present certain hazards to the unborn child. However, all drugs with ++++ are not equally hazardous.
2. *The notations "small" and "large" are used with a variety of addicting and abused drugs. "Small" refers to the usual dosage employed for valid medical indications. "Large" applies to excessive dosages characteristic of illicit or addictive use.
3. **The dangers of vitamins refers to massive quantities occasionally used by food faddists.

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V. The Pregnant Woman and The Man

Ditto 54

____ As a father of an unborn child I will encourage, motivate and make it physically and mentally conducive for the mother of my child to carry out the actions that follow.

____ Give up smoking, drinking and social drug use.

____ Have surgical repair of the cervix early in pregnancy if necessary.

____ Be tested and treated for venereal disease if the possibility of infection exists.

____ NOT be immunized against Rubella.

____ If an Rh- mother carrying an Rh+ infant have medical monitoring of antibody buildup to make a decision about intra uterine transfusion, optimum delivery time and/or transfusion after birth.

____ Have prenatal care for my unborn baby and myself and inform the doctor of any high risk factors of myself, the father or family.

____ Eat meals which supply the unborn child with the optimal calories, protein and nutrients needed for fantastic growth and development.

____ Take vitamins only under a doctor's direction and in quantities not exceeding recommended daily allowances.

____ Gain from 22 to 30 pounds.

____ Cook all meat well done.

____ Avoid contact with cat excretion.

____ Take prescription drugs only as prescribed by a doctor who seriously considers pregnancy "in prescribing".

____ Not take over-the-counter drugs.

____ Not drink water of a high nitrate concentration.

____ Avoid eating excessive amounts of:
beets
spinach
broccoli
celery
lettuce
radishes
kale
mustard greens
collards
sausage
cured meats
ham
bacon
smoked fish products

____ Not paint while pregnant or inhale paint and turpentine fumes.

____ Not use glazed pottery of dubious quality.

____ Wash all fresh fruits and vegetables with soap and water.

____ When using household cleaners wear gloves and have adequate ventilation.

____ Keep cosmetic use to a minimum.

____ Have no dental x-rays.

____ Have medical x-rays only if absolutely necessary and then with a lead apron protection of the baby.

____ Have pelvic x-rays only very close to birth if necessary for birth process decisions.

____ Take planned parenthood classes to prepare for childbirth.

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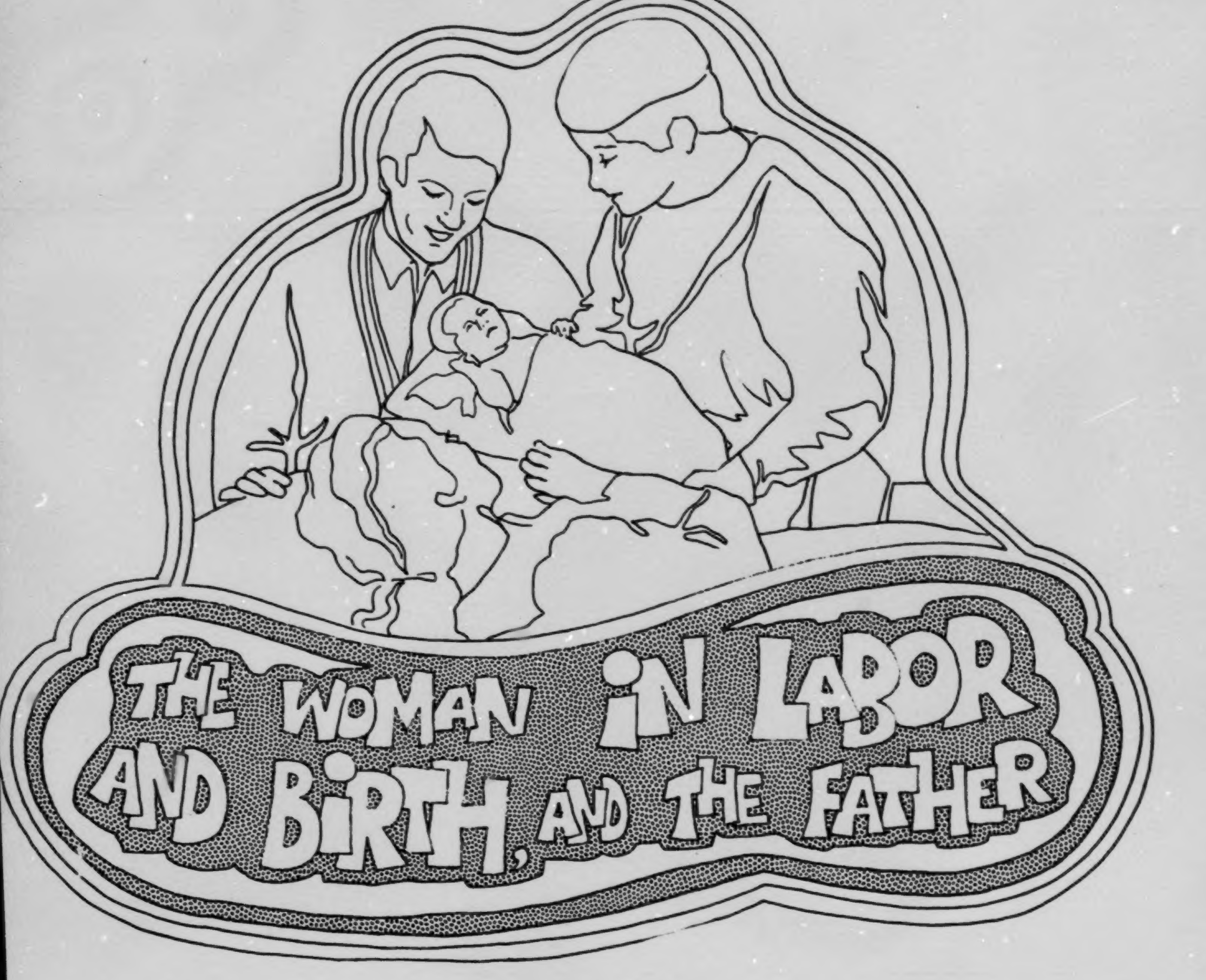

THE WOMAN IN LABOR
AND BIRTH, AND THE FATHER

VI. The Woman in Labor and Birth and The Father

Their Responsibility Towards the Prevention of Mental Retardation in The Next Generation

Objectives

General

a. The student will be aware of the various risks involved for the child in the labor and birth process.
b. The student will know the risks of medication of the mother in labor and birth to the child.
c. The student will know the importance of the man and woman preparing for labor and birth.
d. The student will know that a number of conditions put a child at risk during labor and birth.
e. The student will understand what criteria must be met for a safe home birth.
f. The student will know what physical and environmental conditions facilitate a good labor and birth.

Specific

Cognitive

1. The student will be able to state what is the most common birth and labor risk to the child.
2. The student will be able to explain what lack of oxygen to the brain does to brain cells.
3. The student will be able to state where the U.S. ranks in order of infant deaths and injury among the countries of the world and where it ranks in the developed countries.
4. The student will be able to explain why the high risk mother and infant have a chance at better obstetrical care in countries using midwives for normal deliveries.
5. The student will be able to list 10 types of high risk births which require good medical management and a hospital equipped to handle high risk mothers and infants.
6. The student will be able to give the incidence of birth injury in the United States.
7. The student will be able to explain why immediate cutting of the cord after birth can be detrimental to the infant.
8. The student will be able to list two conditions which may warrant a Caesarean birth.
9. The student will be able to outline three ways in which a man and woman who take prepared childbirth classes can enhance the labor and birth of a child.
10. The student will be able to list eight criteria for a safe and happy home birth.
11. The student will be able to explain why a delayed, induced or stimulated labor is potentially dangerous to the infant.
12. The student will be able to explain why a medicated labor and birth may be hazardous to the infant.
13. The student will be able to state why physical intervention in birth can be detrimental to the infant.
14. The student will be able to explain what is the most efficient physical position for labor and birth.
15. The student will be able to state what piece of equipment can be used to detect the unborn child's position and what piece of equipment can record the unborn child's heartbeat.
16. The student will be able to read an Apgar score meaningfully.
17. The student will be able to explain what early clamping of the umbilical cord does to the infant's blood supply.
18. The student will be able to state what must be given to an Rh- mother having an Rh+ baby soon after birth to prevent harm to her future children.

Affective

1. The student will feel that birth and labor hold a number of risks for the child.
2. The student will feel that the risks of birth and labor for a child can be minimized by a well managed birth and labor both by the parents and the physician.
3. The student will feel that a mother and father must be prepared for birth to give their child as safe a birth as possible.
4. The student will feel that a home birth should be one with prenatal care, a professionally trained midwife and obstetrical and pediatric backup.
5. The student will feel that it is important for the infant to receive a good supply of oxygen during the labor and birth process.
6. The student will feel that a labor which proceeds without interruption, delay and undue speed is best for the child.
7. The student will accept that some labor and births should be considered high risk and need expert medical assistance in a hospital staffed and equipped to handle high risk mothers and infants.
8. The student will feel that an active first stage of labor and a semi-sitting position is more efficient for birth than flat on the back.
9. The student will feel that it is important for an Rh- mother birthing an Rh+ baby to have immunoglobulin within 72 hours after birth.

Background Material for the Teacher

THE RISKY BIRTHDAY PARTY

No other birthday is surrounded by the high death rate which surrounds the day of birth . . . not even the 70th birthday. The death rate is approximately 13 per thousand live births. Birth injuries account for 0.6 deaths per 1000 births. Birth is a stirring biological drama and it is indeed marvelous that the child is so resilient. But not all infants weather the trip to the outside world well. How can we cut the damage rate in at least half? We have the prevention of many of these tragic birthdays at hand. The problem is that Americans do not take pregnancy, labor, and delivery seriously enough. Consider that . .

... Each of us will never be a fetus again!! Therefore the risks and problems involved in birth do not pose a threat to us. We never have to go through the process again. Perhaps that is one reason we don't work to improve the quality of the journey.

... Americans debate if the pregnant woman should he entitled to unemployment during pregnancy. In contrast Russia sees that every pregnant woman receives a special diet supplement and is paid relief while away from work.

... The removal of a brain tumor in the U.S. will involve a minimum of eight people in the operating room, a tremendous financial investment by the hospital and perhaps a prognosis for the patient of twelve more months of life. In contrast a baby born at 4 a.m. in a U.S. hospital may have three people in attendance and a minimal financial investment by the hospital. The combined prognosis for the mother and child will probably be over 100 years of life.

... The U.S. leads all of the developed countries in the rate of infant deaths due to birth injury and respiratory distress.

... We are outranked by fourteen other countries in low infant death rates, Sweden and the Netherlands being the lowest.

... Seventy percent of infants are born in excellent condition. Six percent are born with one or more of the following problems: Unconscious, apathetic, not breathing, irregular heart function, pale or intensely reddened skin, failing reflexes and/or rigid or without muscle tone. Twenty-four percent are born with distress signs that are less alarming but still obvious.

THE PROBLEM with this stressful birthday is that bleeding within the brain, compression of the brain, lack of sufficient oxygen to the brain, failure to breath spontaneously, a lack of oxygen in the blood and distress are all associated with an increased incidence of mental retardation.

A poorly managed labor can result in an infant who shows none of these signs while a more scientific evaluation of the infant may indicate that there are lingering signs of oxygen deprivation before, during and immediately after birth. Signs of minor birth injuries are difficult to evaluate. An infant who has a genetic abnormality whether slight or gross and/or has not prospered well during the growing time in the uterus is more vulnerable to the dangers of birth. The effects of minimal brain damage on the child's behavior, intelligence and adjustment is just beginning to be investigated and more fully understood. In animal studies a lack of oxygen for 8 to 11½ minutes causes permanent brain damage with lesions in the brain, most commonly in the centers of the brain responsible for sensory input. Lack of oxygen for 12 to 17 minutes causes more extensive brain lesions and definite deficits in functioning.

When an infant is born she or he is given an Apgar score at one minute and five minutes after birth. Figure 45 shows the aspects of this rating.

Figure 45 . Apgar Score

Sign	0	1	2	1 min. score	5 min. score
Heart Rate	Absent	Slow Below 100	Over 100		
Respiratory Effort	Absent	Slow Irregular	Good Crying		
Muscle Tone	Limp	Some Flexion of Extremities	Active Motion		
Reflex Irritability*	No Response	Grimace	Cough or Sneeze		
Color	Blue, Pale	Body Pink Extremeties Blue	Completely Pink		

*Response to a catheter in the nostril.

A mode of prevention of birth injuries:

1. We could effect immediate improvement of the outcome of birth if we were to change the pattern of obstetrical care both from a medical and consumer viewpoint. A HEALTHY BIRTHDAY involves the skillful management of labor and delivery by both parents and physician.

Countries with a low incidence of infant deaths and birth injuries have:

   a. Highly trained professional midwives who manage prenatal care, labor, birth and newborn care. The midwife maintains a delicate balance between the mother and child during labor and birth and recognizes problems requiring medical expertise.
   b. In depth medical attention for the high-risk mother because the physician is freed from being midwife at the normal births.
   c. Better prenatal care.
   d. A lowered use of prenatal, labor and birth medication.
   e. Breast feeding.

2. First rate care for the child carried and born to the unwed mother. Every child is legitimate from the child's point of view. As adults we have a great deal of concern about the rising rate of illegitimacy in this country. Concern should not be limited to seeking the causes of this social problem for the situation for the child and mother is worsened by providing second rate care for that mother and child because we do not approve of its circumstances of creation. An attitude of virtue flowing out of an attitude of "we do not approve of what you've done so handle it the best (or worst) you can during pregnancy and birth" is misguided sociology.

COMPONENTS OF A HEALTHY BIRTHDAY PARTY

Lets look at what makes up a labor and birth which is skillfully managed by both the physician and the parents.

1. Both the physician and parents must identify conditions which make labor and birth high risk for the infant and/or mother.

So identified these births must be assisted by a skilled obstetrician and take place in a hospital equipped and staffed to handle high risk labor and births.

Some High Risk Factors of Labor and Birth

Bleeding in abnormal amounts
Toxemia
Too much amnionic fluid
Too little amnionic fluid
Rh incompatability
Multiple births
An unborn child too small for date of birth
A premature labor
An unborn child too large for date of birth
Abnormal birth position of the infant
Rupture of the membranes for more than 12 hours without labor
Infection of the amnionic sac
Infection of the unborn child
Obstruction of the birth canal by the placenta, cord or a growth
Disproportion of the size of the unborn child and the woman's pelvis
A labor which progresses slowly
Premature separation of the placenta from the uterus wall
Venereal disease untreated
Herpes Simplex which is untreatable
Cytomegalovirus
Maternal disease or special health conditions

High risk factors call for a variety of decisions. Decision regarding special delivery techniques, tests and the monitoring of labor must be made between the parents and the physician. A caesarean section may be necessary for disproportionate fetal pelvic size, cytomegalovirus or venereal disease infection of the birth canal, abnormal position of the unborn child or obstruction of the birth canal. Special preparations must be made for the premature infant, one that has not grown well during the 9 months of intrauterine life, one that has an infection, one that is past due or very large or an infant who has possible red blood cell destruction from Rh incompatibility. Medication or physical intervention may be necessary when the membranes have ruptured without labor beginning within 12 hours, low or high blood pressure in the mother, premature separation of the placenta from the uterus wall, a labor that progresses poorly or abnormal bleeding. Danger signals of labor and birth may be monitored by 1) an ultrasound machine which uses sonar waves to locate the position, size and structure of the unborn child in the uterus,

2) a fetal heart monitor which records heart beat patterns and can signal fetal distress during labor.

2. The man and woman should prepare for childbirth so that the woman can learn how to cope with the discomfort of labor and birth, have an in depth understanding of the birth process while the father helps with this management and coping process.

Educating mothers for childbirth and improving the quality of emotional support given to mothers during labor tends to . . .
... lessen or eliminate the mother's need for medication.
... lessens the mother's need for obstetrical intervention.
... shortens labor.
... make birth a more favorable experience.

When the natural childbirth movement began around 1933 it was very doctrinaire and cultish, preaching painless and completely unmedicated labor and birth. When many women failed at this ideal even after preparation there was a feeling of guilt and disillusionment.

The present prepared childbirth movement does not stress painless or unmedicated childbirth but rather physical and mental means for dealing with the discomfort of labor and birth and the reduction or elimination of the need for medication. In one study of 200 couples who attended prepared childbirth classes 23% of the women progressed through the first stage of labor without medication while only 1% of the 200 women who were unprepared did. There was also a higher incidence of spontaneous births, a shorter 1st stage of labor and generally less need for any kind of medication.

Seven percent of all births in 1975 were to parents who had attended prepared childbirth classes. The classes consist of . . .
... a thorough explanation of pregnancy, labor and delivery.
... instruction in relaxation, physical exercises and breathing techniques.
... a technique of pushing the baby out during delivery.
... hospital admitting and obstetrical procedures and medications.
... breast feeding techniques.

The father is trained to give the mother physical, emotional and instructional support. Classes are held from 6 to 8 weeks during the later part of pregnancy. These classes fulfill the requirements of hospitals for admitting the father to the delivery room. The class instructors are specially prepared through The American Society for Psychoprophylaxis in Obstetrics or some other equivalent and are members of the International Childbirth Education Association. The address of prepared childbirth, home births and breast feeding associations are listed under agencies in the introduction to this manual.

3. The physician and parents should work together to lessen or eliminate the need for a medicated labor and birth.

First of all let's see why a medicated birth increases the chances for birth injury to the child. Figure 46 summarizes these risks.

Figure 46 . Risks of the use of medication during labor and birth.

DRUGS	⇨	Result in added burdens for the adjustment of the infant to live outside the uterus.
Alter normal contractions slowing them down.	⇨	Decreasing the mother's ability to cope with the length of labor. Allowing the baby's head to pound the pelvis area for needless length of time. Cord may collapse or be squeezed. Mother may be less able to push the baby out. Forceps and/or pressure on the abdomen may be needed.
Alter normal contractions speeding them up.	⇨	Birth may be too rapid not allowing for the equilization of pressure on the infant's brain and gentle remolding of the skull resulting in broken blood vessels in the brain.
Alter normal contractions making them irregular or unrhythmic.	⇨	Restrict blood flow to the fetus and rob the baby of crucial oxygen.
Decrease oxygen in the mother's blood	⇨	Decrease oxygen supply to the infant.

Figure 46 . Risks of the use of medication during labor and birth. (continued)

DRUGS	⇨	Result in added burdens for the adjustment of the infant to live outside the uterus.
Decrease the mother's blood pressure.	⇨	Decrease the flow of blood and oxygen to the infant and the elimination of carbon dioxide and wastes.
Depress the infant's vital processes.	⇨	Failure to breath, swallow and move vigorously of their own accord. Depress heart rate. Alter Electroencephlogram patterns. Failure to "attend" normally. Greater risk of cord collapse. Greater risk of premature separation of the placenta.
Send 66 to 95% of maternal dosage to the infant.	⇨	For the size of the infant this drug dose is very substantial.
Decreases the infant's temperature	⇨	Decreases chances for the infant's survival due to excessive heat loss.
Gives the infant's liver a large dose of medication to metabolize.	⇨	The liver of the infant is too immature to metabolize and inactivate drugs well.
Increases the carbon dioxide level of mother's blood.	⇨	Decreases the oxygen supply to the infant.

Figure 46. Risks of the use of medication during labor and birth. (continued)

DRUGS	⇨	Result in added burdens for the adjustment of the infant to live outside the uterus.
Alters the acid-base balance of the mother.	⇨	Alters the acid-base balance of the infant.

The adverse effects of medication during labor and birth on the infant has been recognized since the 1800's. However, approximately 85% of women in labor and birth are medicated. Historically drugs given during childbirth are given to produce the desired effect on the women trading off her comfort for the baby's safety. The physician must answer to the mother, rarely to the infant. It has been easier, faster and considered more humane to deliver using drugs rather than spending hours preparing a woman psychologically for birth and coaching her through labor and delivery. The more relief the mother gets from drugs the greater the likelihood of depressing the baby.

Injuries that occur during labor and birth are usually due to insufficient oxygen. When the brain doesn't get enough oxygen for only a few minutes brain cells begin to die. They are lost forever for they cannot be repaired or remade. Cell loss is not necessarily sudden but gradual and progressive. Cell loss or lesions due to oxygen deprivation are not all or nothing but range from minimal loss to extensive loss. For the most part, studies of the effects of drug use on the infant have used standard pediatric and neurological evaluations. There is a need to utilize imaginative testing to assess the more subtle aspects of decreased central nervous functioning.

In one major study 355 preschoolers in which 116 of these had less than normal oxygen in the blood were compared to the 239 with normal levels. The 116 group did significantly poorer than the controls on all tests of cognitive and perceptual functions and exhibited more neurological abnormalities.

All countries with low infant death and birth injury rates--Sweden, Denmark, Finland, Japan and The Netherlands-are far more judicious in their use of medication during labor and birth.

It is the mother and father who must bear the emotional, physical and financial burden of the damaged or impaired child. To give the mother and father such a burden as well as devastate the life of an individual to give the mother a few hours of relative comfort is misguided kindness. We now have thousands of pain relievers that can make labor and delivery more comfortable. However, none of these drugs can be labeled completely safe for the infant. In general they slow down and delay labor, lowering the oxygen flow to the infant and invade his or her small body. The balanced use of drugs can be achieved by preparing couples for childbirth, taking the safest drugs when they are necessary and not automatically using drugs in childbirth. Figure 47 summarizes the effect of a number of medications used in labor and birth on the infant.

Figure 47 . The effect of various drugs used in labor and birth on the newborn. A minus sign (-) stands for no significant effect.

Name of the Drug	Effect on the Newborn
Narcotics: Morphine Demerol Heroin Dolophine Nisentil Levo-Dromoran Dihydrocodeine	Depression of fetal respiration. Decreased responsiveness of the newborn.
Narcotic Antagonists: Nalline Lorfan	Decrease in neonatal depression caused by narcotics. Misused they may act as a depressant.
Barbiturates: Phenobarbitol Amytal Seconal Nembutal	Cause minimal fetal depression.
Sodium Pentothal Surital	Decreased responsiveness and poor sucking ability in the early neonatal period.
Other Sedatives:	
Chloral hydrate	-
Placidyl	-
Ethyl alcohol	May decrease uterine contractions.

Figure 47 . The effect of various drugs used in labor and birth on the newborn. A minus sign (-) stands for no significant effect. (continued)

Name of the Drug	Effect on the Newborn
Inhalation anesthetics:	
Ether	Depresses the infant by direct narcotic effect. Does not interfere with oxygenation.
Cyclopropane	Depression dependant on duration.
Nitrous Oxide	- If oxygen added in ratios of 20% or more.
Trilene	-
Penthrane	- Unless mother deeply anesthetized.
Fluothane	- If given in short duration.
Skeletal muscle relaxants: Curare Flaxedil Anectine Syncurine	- In usual clinical doses.
Local Anesthetics: Xylocaine Carbocaine Novocain Pontacaine	May depress by direct drug effect or indirectly by maternal low blood pressure.
*A minus sign(-) stands for no significant effect.	

5. Delaying birth is mentioned only to be, as the American Medical Association Manual on Mental Retardation puts it "condemned".

Physically pushing the baby back inside the mother or forcing her feet together to delay the birth of the baby is inhumane and unethical. The practice may be more widespread than is imagined. A survey of nine institutions for the mentally retarded indicated that a total of 130 infants had a history of being held back at birth. Holding back of a baby's head in consideration of the mother, doctor or hospital can lead to serious damage to the infant.

6. Induction of labor where there is no clear medical indication for this procedure can subject the infant to unnecessary risks.

When the onset of labor occurs spontaneously the contractions increase in length and intensity gradually and provoke in the mother an accompanying tolerance for pain and discomfort. In contrast an induced labor alters the normal fetal heartrate. During a contraction the unborn child normally receives less oxygen. Consider some of the adverse effects of induced labor

- an uneven, abrupt labor
- bubbles of amnionic fluid blocking a blood vessel
- lacerations of the cervix and birth canal
- rupture of the uterus
- excessive bleeding
- lack of oxygen to the unborn child
- bleeding within the skull
- a lack of blood clotting fibrin in the blood
- water intoxication
- difficulty of the mother in tolerating intensified contractions

7. The routine use of forceps, suction or physical pressure on the abdomen (top of the uterus) to relieve maternal distress or hasten delivery causes undue risks for the infant.

The routine use of forceps can cause bleeding within the brain and damage to nerves in the infant's face and arm. Pressure applied on the woman's abdomen and thus on the uterus can decrease the oxygen flow to the infant.

8. The woman should remain up and active during labor until the membrane breaks.

In almost all countries except the United States a woman in labor is routinely encouraged to walk about and be active for as long as she wishes until the membranes rupture. Such activity facilitates labor and the positioning of the infant's head for birth.

9. The woman should be in a semi-sitting position for birth.

The typical position for delivery in the United States is the mother lying flat on her back with her feet in stirrups. Such a position
- adversely effects the mother's blood pressure and oxygen intake.
- decreases the intensity of normal contractions.
- inhibits spontaneous pushing by the mother.
- inhibits the expulsion of the cord and placenta
- increases the need for cutting of the mother and thus a local anesthetic.

10. The clamping of the cord should be delayed.

Late or delayed clamping of the unbilical cord increases the infant's total blood supply by 27% and the red blood cell volume by 47%. Late clamping is a part of the sequence of childbirth of most of the world where birth is an unhurried, natural process. Early clamping in the United States is in part related to the fact that there is no room for him or her on the delivery table. This routine procedure deprives the newborn of placental oxygen and increases the risk of respiratory distress and anemia.

11. After birth parents should request the Apgar score of their infant.

If problems in learning or function develop the Apgar Score may be helpful in establishing the cause of such problems.

12. An Rh- mother should receive immunoglobulin 72 hours after having an Rh+ baby.

The rather routine procedure can prevent destruction of a future baby's red blood cells by Rh+ antibodies.

HOW ABOUT A BIRTHDAY AT HOME ?

- Is it safe?
- Does it prevent or increase the incidence of mental retardation?

Home births are probably discussed, considered and often desired by many young mothers and fathers today. Delivery at home is not automatically or necessarily better or worse than a birth in a hospital. Over one half of women in the Netherlands, Holland and Norway give birth at home with the assistance of a professional midwife and maternity aide. Their comparatively low incidence of infant deaths and birth trauma is evidence of the comparative safety of a properly developed home delivery system.

In 1935 35% of babies in this country were born in hospitals and the rest at home. By 1965 65% were born in hospitals and by 1976 95%. This trend may be reversing. Compare some of the disadvantages of a hospital birth compared to a birthday at home.

Figure 48 . Advantages of home birth.

HOME	HOSPITAL
Familiar "personnel"	Unfamiliar personnel.
Relaxed atmosphere.	Stressful atmosphere.
A family affair with the doctor assisting rather than dictating.	Separation from loved ones.
Less medication.	More likely to have medication.
Natural support by family and husband.	"Treatment" mode.
Mother remains active during the first stage of labor.	Mother is confined to bed for labor.
Mother labors and delivers in the same bed.	Mother is moved from a labor room to a delivery room for birth.
The woman does not have to travel during labor.	Woman must travel during labor.
Labor proceeds at natural rate.	Attempts sometimes made to accelerate or slow down labor.

Because the mother is in relaxed, familiar surroundings with psychological support during labor and birth the whole process is apt to be shorter, drug free and in a good position with a maximum amount of blood flow and oxygen to the infant. If anything does happen during labor at home that necessitates transferring the "birthday" to the hospital the woman would be taking the same action as 95% of other laboring women in this country who go early, in the middle, just in time or too late for a hospital birth.

About 8% of all births are considered to be potentially high risk. These are practically always known in advance and birth should take place with skillful medical care in relation to the physician and the hospital.

The criteria for a safe home birth of a group of midwives who are graduate nurses with two years of intensive obstetrical training and are under the supervision of an obstetrician, pediatrician and several social disciplines are:

1. a desire for home birth
2. a desire for breast feeding
3. a clean, well organized home
4. attendance of the man and woman at prepared childbirth classes
5. prenatal care under the supervision of an obstetrician and a well trained midwife
6. prenatal pediatric consultation and supervision
7. postnatal pediatric consultation and supervision
8. no high risk factors of pregnancy or early labor
9. a professionally trained midwife for all of labor and delivery
10. a baby scale
11. a contingency plan if the mother must be transferred to a hospital

Birth in a hospital could be made as normal and as homelike as possible meeting many of the homelike criteria as possible. Midwives could be used throughout labor and birth under a physician's supervision. Countries who use nurse-midwives for normal maternity patients have significantly decreased the infant death and injury rate. Unless we incorporate the philosophy and techniques of countries such as Holland, Norway, Finland and Japan into our care of the child and mother during pregnancy and birth we will continue to be ranked #14 or lower in terms of infant births without death or injury.

Pretest

Cognitive

1. The most common labor and birth risk to the infant is
   ____a. lack of oxygen.
   ____b. hemorrhaging.
   ____c. broken bones.

2. Lack of oxygen to the infant during the birth process causes
   ____a. drug intoxication.
   ____b. a decrease in blood pressure.
   ____c. brain cell destruction.

3. The United States ranks ____ in the number of infants born without death and injury at birth among the countries of the world.
   ____a. 1st
   ____b. 10th
   ____c. 14th

4. The use of a professional midwife system allows
   ____a. the doctor to give more time to high risk mothers.
   ____b. the woman to have support during the labor and birth process.
   ____c. both of the above.

5. About ____% of all births result in birth injury.
   ____a. 1
   ____b. 5
   ____c. 10

6. Immediate clamping of the cord
   ____a. cuts down on an infant's total blood volume.
   ____b. cuts down on an infant's number of red blood cells.
   ____c. both of the above.

7. The infant or couple who are identified as high risk should
   ____a. have their baby in a well staffed and well equipped hospital.
   ____b. have a home birth with a professional midwife.
   ____c. neither of the above.

8. Conditions which might require a Caesarean are
   ____a. a disproportionate size of the infant and pelvic opening.
   ____b. infection of the birth canal by venereal disease or cytomegalic virus.
   ____c. both of the above.

9. Prepared childbirth classes instruct the couple in
   ____a. a completely drug free birth.
   ____b. breathing, relaxing, exercising and birthing techniques.
   ____c. home birth.

10. Medication during birth and labor
   ____a. cuts down on the flow of oxygen to the infant.
   ____b. slows down the birth process.
   ____c. may do either or both of the above.

11. The induction of labor could be justified for a woman who
   ____a. is several days overdue.
   ____b. wants her baby born on a particular date.
   ____c. has not started labor 13 hours after the membranes have ruptured.

12. The best position in birth to facilitate pushing by the mother is
   ____a. lying on her back.
   ____b. in a semi-sitting position.
   ____c. lying on her side.

13. Forceps routinely used in birth may
   ____a. cause bleeding within the brain.
   ____b. damage the nerves of the face.
   ____c. both of the above.

14. In a birth which is high risk the physician may use a ____ to record the heartbeat of the unborn child to detect infant distress.
   ____a. x-ray
   ____b. fetal monitor
   ____c. sonograph

15. An Apgar Score of ____ would be considered excellent.
   ____a. 2
   ____b. 9
   ____c. 5

16. An Rh- mother who has an Rh+ infant should be given ____ within 72 hours after birth.
   ____a. penicillin
   ____b. blood
   ____c. immunoglobulin

Key: 1.a, 2.c, 3.c, 4.c, 5.c, 6.c, 7.a, 8.c, 9.b, 10.c, 11.c, 12.b, 13.c, 14.b, 15.b, 16.c.

Affective

Circle the word or words that best describe the intensity of your feelings.

1. I feel that the labor and birth of an infant must be well managed by both the parents and the physician to minimize birth injury to the infant.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

2. I feel that the mother and father of an infant should take prepared childbirth classes in order to lessen the amount of medication the mother will need during labor and birth.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

3. I feel that prenatal care, a professionally trained midwife with obstetrical and pediatric supervision are essential to a safe home birth.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

4. I feel that a lack of oxygen to the infant during the labor and birth process can cause death and injury to brain cells.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

5. I feel that a labor which proceeds without interruption, delay or undue speed is best for the infant.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

6. I feel that it is important for the mother and father to identify with the physician possible high risk factors of pregnancy and birth.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

7. I feel that a delayed birth is dangerous for the infant.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

8. I feel that induced labor should take place only for clear and specific medical reasons.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

9. I feel that a woman should be active during the first stage of labor.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

10. I feel that the semi-sitting position is a more efficient position for birth than flat on the back.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

11. I feel that early clamping of the umbilical cord robs the infant of some of his blood supply.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

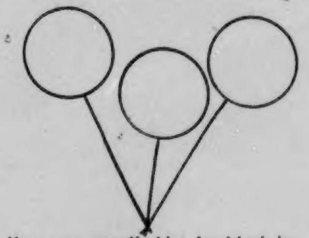
12. I feel that the Rh- woman giving birth to an Rh+ child must have immunoglobulin soon after birth to protect future children.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

Mini-Lecture or Presentation

"The Original Birthday Party"

In the class preceding this one give out invitations to "the original birthday party" prepared from ditto 55 .



You are cordially invited to a BIRTHDAY PARTY.

Time: (class time)
Place: (class room #)
Signed: A human being!

*Please bring only Gifts of Self

Ask for volunteers to bring a cake, balloons and some empty boxes wrapped for the party.

If possible introduce this unit of study with a movie on birth:

A Child Is Born	#15
A Story About Childbirth	#10
Birth-Day-Through The Eyes of The Mother	#10
Childbirth-A Family Experience	#10

Perhaps we subconsciously celebrate our birthday each year not so much out of joy that we are a year older but because we have survived the tough journey from the world inside our mother to the outside. It is a relatively short journey both in time and length but the planning for and carrying out this extremely crucial "birthday party" is tremendously important. It has a part to play in how intact, whole and healthy each of us will be for the rest of our lives. It cannot be an impromptu party-a happening! It must be well managed by both the parents and the physician. For the infant who has a genetic defect or has not prospered well in the mother extra special preparations are vitally important...they may make the difference between mental retardation and normalcy or normalcy and a lessening of potential.

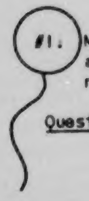
STUDENT INVOLVEMENT:
Let's play a game and then have some cake! Explain and play the game of mirrors:

1. Each student chooses a partner.
2. One student of each pair is the leader. Each pair stands facing each other.
3. The leader moves arms, legs, head or "whatever" very slowly making up a variety of motions.
4. His or her partner mirrors the movements of their partner.
5. Now we are going to change the movements to opposites.
6. One student of each pair is again the leader and moves arms, legs, etc. very slowly making up a variety of motions. Their partner makes the opposite motion.

Play mirror and
opposites for
5 minutes.

There are many aspects of labor and birth which must be carried out in ways opposite to what has been done in the past in this country to assure that the infant has a safe and healthy birthday. Let's see what should happen at this party.

"Happenings at The First Birthday Party"



#1. Many couples go to the hospital for the birth of their child as if nothing could ever go wrong, as if their child could not possibly be at any kind of a risk.

Question: What would be the opposite of this attitude? Draw out ideas and concepts.

Concept: The party goers, the mother, father and physician must decide if there are any aspects of the life of the unborn child that make this birth one which takes extra special preparation.

Here is a card (prepared from ditto 56) that has some of the factors which would indicate that the mother, father and physician must consider this birth high risk requiring a well staffed and well equipped hospital plus a skilled obstetrician to make special decisions.

Some High Risk Factors of Labor and Birth
Bleeding in abnormal amounts Toxemia Too much amnionic fluid Too little amnionic fluid Rh incompatability Multiple births An unborn child too small for date of birth Abnormal birth position of the infant Rupture of the membranes for more than 12 hours without labor Infection of the amnionic sac Infection of the unborn child Obstruction of the birth canal by the placenta cord or a growth Disproportion in the size of the unborn child and the woman's pelvis A labor which progresses slowly Premature separation of the placenta from the uterus wall Venereal disease untreated Herpes Simplex which is untreatable Cytomegalovirus Maternal disease or special health conditions

Let the students question what special action must be taken in some of these high risk situations. If they do not ask go through possible special handling of some of these high risk aspects. Answers are given under #1- "Components of a Healthy Birthday" in the teacher's background material of this unit.

#2. Besides not considering if their child or they themselves have any high risk factors, the majority of couples, 93% have no preparation for childbirth. The birthday is about to begin and the woman and child do the best that they can in an experience that they have never been through.

Question: What would be the opposite of this situation? Elicit ideas.

Concept: The father and mother should prepare themselves for the "party".

We rarely go to a party without preparation of gifts, clothes, thought. This fantastic birthday party takes preparation. The woman and man should have an in depth understanding of pregnancy, labor and delivery, instructions in relaxation, breathing techniques, techniques in pushing the baby into the world and information on medications and their relative risks and safety. The father is vital in this education process for he must "coach" the woman through labor and birth and will be better able to make some of the special decisions that may have to be made as the woman works hard to birth their child. Such teamwork will most likely-

- lessen the mother's need for medication.
- increase the mother's ability to cope with the pain and hard work of labor.
- lessen the mother's need for physical help by the physician.
- shorten labor.
- make spontaneous birth a greater possibility.
- make birth a more satisfying experience.

#3. The majority of mothers, fathers and physicians feel that birth is a party where drugs are the routine rather than the exception. Eighty-five percent of mothers giving birth are medicated.

Question: What would be the opposite of routine drug use? Ideas, ideas, what are your ideas?

Concept: Medications during birth and labor should be used only if absolutely necessary and then only those which are considered relatively safe.

Consider what happens when drugs are given to the mother in labor and birth. Give out Drugs and Risk Chart prepared from Ditto 57.

Name of Drug	Effect on Newborn
Narcotics: Morphine Demerol Heroin Dolophine Nisentil Levo-Dromoran Dihydrocodeine	Depression of fetal respiration. Decreased responsiveness of the newborn.

Risk Chart prepared from Ditto 57 . (continued)

Name of Drug	Effect on Newborn
Narcotic antagonists: Nalline Lorfan	Decrease in neonatal depression caused by narcotics. Misused they may act as a depressant.
Barbiturates:	Cause minimal fetal depression.
Phenobarbital Amytal Seconal Nembutal	
Sodium Pentothal Surital	Decreased responsiveness and poor sucking ability in the early neonatal period.
Other Sedatives:	
Chloral hydrate	-
Placidyl	-
Ethyl alcohol	May decrease uterine contractions.
Inhalation anesthetics:	
Ether	Depresses the infant by direct narcotic effect. Does not interfere with oxygenation.
Cyclo propane	Depression dependant on duration.
Nitrous oxide	- If oxygen added in ratios of 20% or more.
Trilene	-
Penthrane	- Unless mother deeply anesthetized.
Fluothane	- If given in short duration.
Skeletal muscle relaxants: Curare Flaxedil Anectine Syncurine	- In usual clinical doses.

Risk Chart prepared from Ditto 57 . (continued)

Name of Drug	Effect on Newborn
Local Anesthetics: Xylocaine Carbocaine Novocaine Pontacaine	May depress by direct drug effect or indirectly by maternal low blood pressure.
*A minus sign(-) stands for no significant effect.	

Question: What very general conclusions could you draw from this chart?

Right! A drugless party would be best. Medications put an added burden on the infant in his or her adjustment to life outside the uterus and in general decrease the flow of vital oxygen to the infant and depress central nervous functions. An infant who is intact genetically and has prospered well in the uterus may be able to cope with these two factors but for an infant who has a genetic defect and/or has not prospered well in the uterus medication may be the "last straw" in his or her fight for life or normalcy.

This is a party where "oxygen must be served as "refreshments". When the infant's brain does not get sufficient oxygen during labor and birth brain cells are destroyed or injured never to be repaired or replaced. All countries with a low infant death and birth injury rate are more judicious in their use of medications during labor and birth. We rank 14th in live and uninjured birth rates among countries of the world. To injure the brain of an infant to give the mother a few hours of relative comfort is misguided kindness. Drugs slow down labor, lower the oxygen flow of the infant and invade the infant's tiny body.

A balanced use of drugs can be achieved by -
- preparing couples for childbirth.
- using drugs which are the safest when they are absolutely necessary.
- never automatically using drugs in childbirth.

#4. Sometimes the birth process is induced (started), speeded up or delayed for a variety of reasons. Some of the reasons are not medically sound.

Question: What would be the opposite of these types of procedures in birth? Draw out the concepts.

Concept: Labor and birth should proceed at a natural rhythm and speed.

Holding back a baby when it is ready to be born can cause oxygen deprivation and physical damage to the infant.

Inducing labor or speeding it up needlessly can cause an intense, hard labor with danger of tearing the birth canal and cervix, rupturing the uterus, excessive bleeding, lack of oxygen to the infant and difficulty of the mother tolerating intensified contractions.

There are specific medical reasons for inducing or speeding up some labors such as when the membranes break and labor does not begin within 12 hours or if the baby is extremely overdue.

#5. The routine use of forceps or suction to extract the baby from the mother to relieve or hasten delivery causes undue risks for the infant.

Question: What would be the opposite procedure for the exit of the baby from the woman's body? Ask for ideas, ideas, ideas.

Concept: Allowing the mother to push the baby out in a way in which she has been prepared to do is a much safer procedure than using forceps or suction.

Forceps are not needed as a utensil at most birthdays! Although forceps have their legitimate use in unusual births they can cause bleeding within the brain and damage to nerves in the infant's face and arm. Also pressure on the woman's abdomen can decrease the flow of oxygen to the infant.

#6. A woman in labor is almost always confined to bed and then moved to a delivery table and gives birth flat on her back.

Question: What are opposites for both these routine aspects of birth?

Concept: In almost all countries except the United States a woman in labor is routinely encouraged to walk about and be active until the membranes break.

The semi-sitting position for birth enhances the mother's oxygen intake, keeps contractions increasing in intensity and facilitates the expulsion of the cord and placenta.

Even though this is a serious party a more natural seating of the guests has definite advantages for the child. The guest of honor deserves more consideration! Activity during the first stage of labor makes labor proceed more quickly with a better blood flow to the infant and positions the infant's head for its exit.

The guests at the birthday party need to be in a more natural physical position and in more natural surroundings to cut down on the fear and anxiety of the mother which in turn allows labor and birth to occur more spontaneously.

#7. The delivery table of U.S. hospitals does not allow room for the birthday child. He or she must have the cord cut and be separated from the mother and father.

Question: What would be opposite of this early cord cutting or clamping?

Concept: Clamping or cutting the cord should be delayed.

A party should be an unhurried event. Delayed clamping of the cord increases the infant's total blood supply by 25% as it flows in from the cord and increases red cell volume by 47%. Late clamping is a part of the sequence of childbirth of most of the world where birth is an unhurried, natural process. Early clamping deprives the newborn of placental oxygen and increases the risk of respiratory distress and anemia.

"After The Party Is Over"

#8. After giving a party "the givers" usually discuss "how it went". After birth the parents should request the Apgar score of their infant. Only one minute old and she or he is already being tested! This is how the Apgar rating works. Draw it on the board and go through the ratings.

Sign	0	1	2	1 min. Score	5 min. Score
Heart Rate	Absent	Slow Below 100	Over 100		
Respiratory Effort	Absent	Slow Irregular	Good Crying		
Muscle Tone	Limp	Some Flexion of Extremities	Active Motion		
Reflex Irritability	No Response	Grimace	Cough or Sneeze		
Color	Blue, Pale	Body Pink Extremities Blue	Completely Pink		

If problems in learning or functioning develop the Agpar Score may be of some help in establishing the cause of such problems.

#9. After the birth an Rh- mother having an Rh+ baby should receive immunoglobulin 72 hours after birth. This prevents the destruction of a future baby's red blood cells being destroyed by Rh+ antibodies.

"How About A Birthday Party At Home?"

Ninety-five percent of all births in the U.S. take place in hospitals.

Question: What would be the opposite of this custom?

Concept: In the U.S. Birth and Death have been taken out of the family and given to professionals to handle. We feel uncomfortable viewing and giving physical and psychological assistance in both of these aspects of our lives.

In Holland, Norway and The Netherlands over 1/2 of women give birth at home with the assistance of a professional midwife and maternity aide. The low incidence of infant death and birth injuries give support to the notion that a home delivery system is relatively safe.

Question: When you think of birth at home who do you picture giving the party?

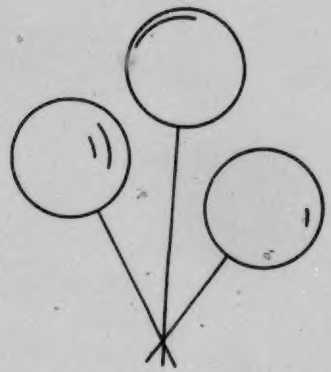
In other countries as well as in the U.S. home births should be handled by a midwife who is a graduate nurse with two years of intensive obstetrical training and is under the supervision of an obstetrician and a pediatrician. High risk pregnancies, about 8%, are always handled in a hospital. Those desiring a home birth must:

1. "Desire" a home birth.
2. Want to breast feed.
3. Have a clean, well organized home.
4. The man and woman must attend prepared childbirth classes.
5. Have prenatal care under the supervision of an obstetrician or a well trained midwife.
6. Have pediatric consultation and supervision both pre and postnatally.
7. Have no high risk factors.
8. Have a professionally trained midwife for all of labor and delivery.
9. Have a baby scale.
10. Have a contingency plan if the mother must be transferred to a hospital.

Countries who use nurse-midwives for normal maternity patients have significantly decreased the infant death and injury rate. Unless we incorporate the philosophy and techniques of countries such as Holland, Norway, Finland and Japan into our care of the child and mother during pregnancy and birth we will continue to rank #14.

. . . As you plan for the future

. . . Plan a fantastic Birthday Party for your child or children.



☐ Classroom Experience Options

1. Show a film to emphasize, explain or extend a concept or feeling:

   a. Title: A Child Is Born
      Time: 3 min. color film junior and senior high school
      Content: Shows actual childbirth from examination of the mother through infant examination and nursing. The narration describes each part of the delivery process.
      Available from: ⊗ #15

   b. Title: A Story About Childbirth P-102
      Time: 30 min. black and white film senior high school
      Content: Prepared by a physician showing his plan for childbirth education and training.
      Available from: ⊗ #10

   c. Title: A Normal Birth P-70
      Time: 11 min. black and white film senior high school
      Content: Designed for use in expectant parent education groups. It is a literal photographic record of an actual delivery in a hospital with the mother awake.
      Available from: ⊗ #10

   d. Title: Birth-Day Through The Eyes of The Mother P-117
      Time: 30 min. color film senior high school
      Content: This film shows one kind of modern maternity care, hospital, medical and nursing, from the viewpoint of the mother. Viewers see only what the mother sees in labor and delivery.
      Available from: ⊗ #10

   e. Title: Childbirth, The Great Adventure P-81
      Time: 20 min. color film junior and senior high school
      Content: The purpose of this film is to remove the fear of childbirth from the minds of young people and to replace it with a feeling of confidence and pleasurable expectations.
      Available from: ⊗ #10

   f. Title: Childbirth--A Family Experience P-46
      Time: 20 min. color film junior and senior high school
      Content: A film showing how childbirth is rapidly becoming a family experience-prenatal classes, the responsibility of the father during birth and how the mother is supported by the family during this important period.
      Available from: ⊗ #10

   g. Title: From Generation to Generation USC-448
      Time: 30 min. color film senior high school
      Content: Animation and live action photography portray conception, development and the birth of a child. A feeling of love and natural expectancy the impending birth holds for the family is captured.
      Available from: ⊗ #11 Rental: $13.00

   h. Title: Labor and Childbirth P-13
      Time: 18 min. black and white senior high school
      Content: The story of a young couple expecting their first child beginning before labor following through with birth preparations, identification of delivery room equipment, how uterine muscles contract, the movement of the baby through the birth canal, delivery and return to the room.
      Available from: ⊗ #10

   i. Title: Support During Labor P-47
      Time: 20 min. color film senior high school
      Content: Shows in detail techniques of giving emotional and physical support through normal labor. Particular attention is paid to positions that promote comfort. Methods of teaching relaxation while labor is in progress are illustrated. Delivery in the curved back position is shown.
      Available from: ⊗ #10

   j. Title: Mr. and Mrs. Maternity P-84
      Time: 22 min. color film junior and senior high school
      Content: A prenatal training informational film made through the combined efforts of four obstetricians and a psychiatrist. It provides a basis for understanding the physiological events of normal pregnancy, labor and delivery.
      Available from: ⊗ #10

2. Speakers and Panel Discussions:

   a. A nurse demonstrates the fetal monitor and speaks on its use and potential in detecting the infant in distress.
   b. A panel discussion of the advantages and disadvantages of Home births and Hospital births.
   c. A parent of a child who suffered from lack of oxygen at birth to relate their experiences.
   d. A couple who are preparing for childbirth to tell of their experiences in the classes and their feelings about the impending birth.
   e. A couple who have recently given birth after attending prepared childbirth classes to talk about their childbirth experience.

   f. A neonatalogist (specialist in newborn infants) to talk on optimum labor and birth procedures to insure a healthy newborn.
   g. An obstetrician and midwife to discuss how they compliment each other's skills.

3. Biology projects:
   a. Dissect a pregnant rat to observe the position, cord, placenta, etc. of the baby.
   b. Keep animals such as mice or hamsters which have a high birth rate so animal birth can be observed in the class room.

4. Have a doctor come to class and take a medical history from students to demonstrate how high risk factors are identified.

5. Role play: a couple who wants to attend prepared childbirth classes and a couple who do not. Each couple is trying to win the other over to their way of thinking.

6. Discussion questions:
   a. How can the father help prevent mental retardation of his child during the labor and birth process?
   b. How can the physician, mother and father work together to prevent mental retardation during labor and birth?
   c. What is your concept of a midwife?

7. Write for information on prepared childbirth classes.

Outside Classroom Experience Options

1. Observe a birth of an animal on a farm.
2. Attend a prepared childbirth class.
3. Interview a hospital pathologist to inquire about his findings (in general) in babies who die soon after birth or fail to breath.
4. Interview an obstetrician about his or her philosophy regarding medication during labor and birth and the birth position.
5. Tour a hospital delivery, labor and newborn section.

Action Checklist

Pass out action checklist prepared from ditto 58. Use this as a summary for this unit of studv.

LABOR
AND BIRTH

____ I will identify conditions which make labor and birth high risk for the infant, myself or the mother of my child.

____ I will ask the physician if any conditions exist which make this labor and birth high risk.

____ I will choose a hospital which is staffed and equipped to handle high risk mothers and infants if any conditions exist that are high risk.

____ I will participate in the birth of my child using breathing, relaxation, pushing and coping techniques learned in prepared childbirth classes or as the father assist with such techniques.

____ I will use medication in childbirth only if absolutely necessary and then only ones that are considered relatively safe.

____ I will not allow the delay of birth of my child.

____ I will discourage the routine use of forceps or physical pressure to hasten the delivery of my child.

____ I will remain active (not in bed) for the first stage of labor or as the father be supportive during this stage of labor.

____ I will deliver my infant in a semi-sitting position or support the mother of my child in such a position.

____ I will discourage early clamping of the infant's umbilical cord.

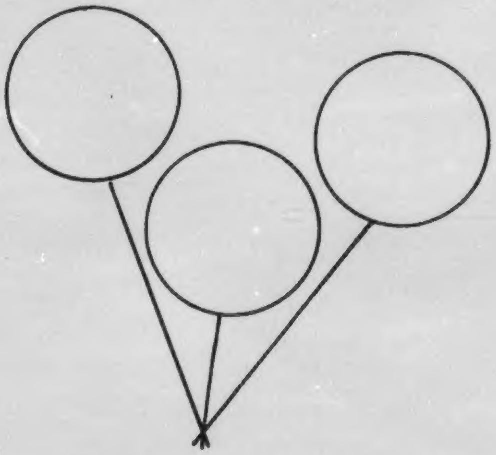
____ I will request the Apgar score of my infant after birth.

____ If I choose to have a home birth I will meet all of the criteria necessary as spelled out by a professional midwife and obstetrician for a safe home birth.

____ If I am a Rh- mother birthing a Rh+ baby I will make sure that I receive Immunoglobulin within 72 hours after birth or see that the mother of my child receives it.

VI. The Woman in Labor and Birth and The Father

Ditto 55



You are cordially invited to a
BIRTHDAY PARTY.

Time:
Place:
Signed: A Human Being!

*Please bring only gifts of self

VI. The Woman in Labor and Birth and The Father

Ditto 56

Some High Risk Factors of Labor and Birth

Bleeding in abnormal amounts
Toxemia
Too much amnionic fluid
Too little amnionic fluid
Rh incompatability
Multiple births
An unborn child too small for date of birth
Abnormal birth position of the infant
Rupture of the membranes for more than 12 hours without labor
Infection of the amnionic sac
Infection of the unborn child
Obstruction of the birth canal by the placenta, cord or growth
Disproportion in the size of the unborn child and the mother's pelvis
A labor which progresses slowly
Premature separation of the placenta from the uterus wall
Venereal disease untreated
Herpes Simplex which is untreatable
Cytomegalovirus
Maternal disease

Ditto 57

Drugs and Risk Chart

Name of the Drug	Effect on the Newborn
Narcotics: Morphine Demerol Heroin Dolophine Nisentil Levo-Dromoran Dihydrocodeine	Depression of fetal respiration. Decreased responsiveness of the newborn.
Narcotic Antagonists: Nalline Lorfan	Decrease in neonatal depression caused by narcotics. Misused they may act as a depressant.
Barbiturates: Phenobarbitol Amytal Seconal Nembutal	Cause minimal fetal depression.
Sodium Pentothal Surital	Decreased responsiveness and poor sucking ability in the early neonatal period
Other Sedatives:	
Chloral hydrate	-
Placidyl	-
Ethyl alcohol	May decrease uterine contractions.
Inhalation anesthetics:	
Ether	Depresses the infant by direct narcotic effect. Does not interfere with oxygenation.
Cyclopropane	Depression dependent on duration.
Nitrous oxide	-

Drugs and Risk Chart (continued)
Ditto 57

Name of the Drug	Effect on the Newborn
	If oxygen added in ratios of 20% or more.
Trilene	-
Penthrane	-
	Unless mother deeply anesthetized.
Fluothane	-
	If given in short duration.
Skeletal muscle relaxants:	-
Curare	In usual clinical doses.
Flaxedil	
Anectine	
Syncurine	
Local Anesthetics:	
Xylocaine	May depress by direct drug effect or indirectly by maternal low blood pressure.
Carbocaine	
Novocaine	
Pontacaine	

*A minus sign(-) stands for no significant effect.

VI. The Woman in Labor and Birth and The Father

Ditto 58

____ I will identify conditions which make labor and birth high risk for the infant, myself or the mother of my child.

____ I will ask the physician if any conditions exist which make this labor and birth high risk.

____ I will choose a hospital which is staffed and equipped to handle high risk mothers and infants if any conditions exist that are high risk.

____ I will participate in the birth of my child using breathing, relaxation, pushing and coping techniques learned in prepared childbirth classes or as the father assist with such techniques.

____ I will use medication in childbirth only if absolutely necessary and then only ones that are considered relatively safe.

____ I will not allow the delay of birth of my child.

____ I will discourage the induction of labor unless there is a clear cut indication for it.

____ I will discourage the routine use of forceps or physical pressure to hasten the delivery of my child.

____ I will remain active (not in bed) for the first stage of labor or as the father be supportive during this stage of labor.

____ I will deliver my infant in a semi-sitting position or support the mother of my child in such a position.

VI. The Woman in Labor and Birth and The Father

Ditto 58

Action Checklist Continued

____ I will discourage early clamping of the infant's umbilical cord.

____ I will request the Apgar score of my infant after birth.

____ If I am a Rh- mother birthing a Rh+ baby I will make sure that I receive immunoglobulin within 72 hours after birth or see that the mother of my child receives it.

____ If I choose to have a home birth I will meet all of the criteria necessary as spelled out by a professional midwife and obstetrician for a safe home birth.

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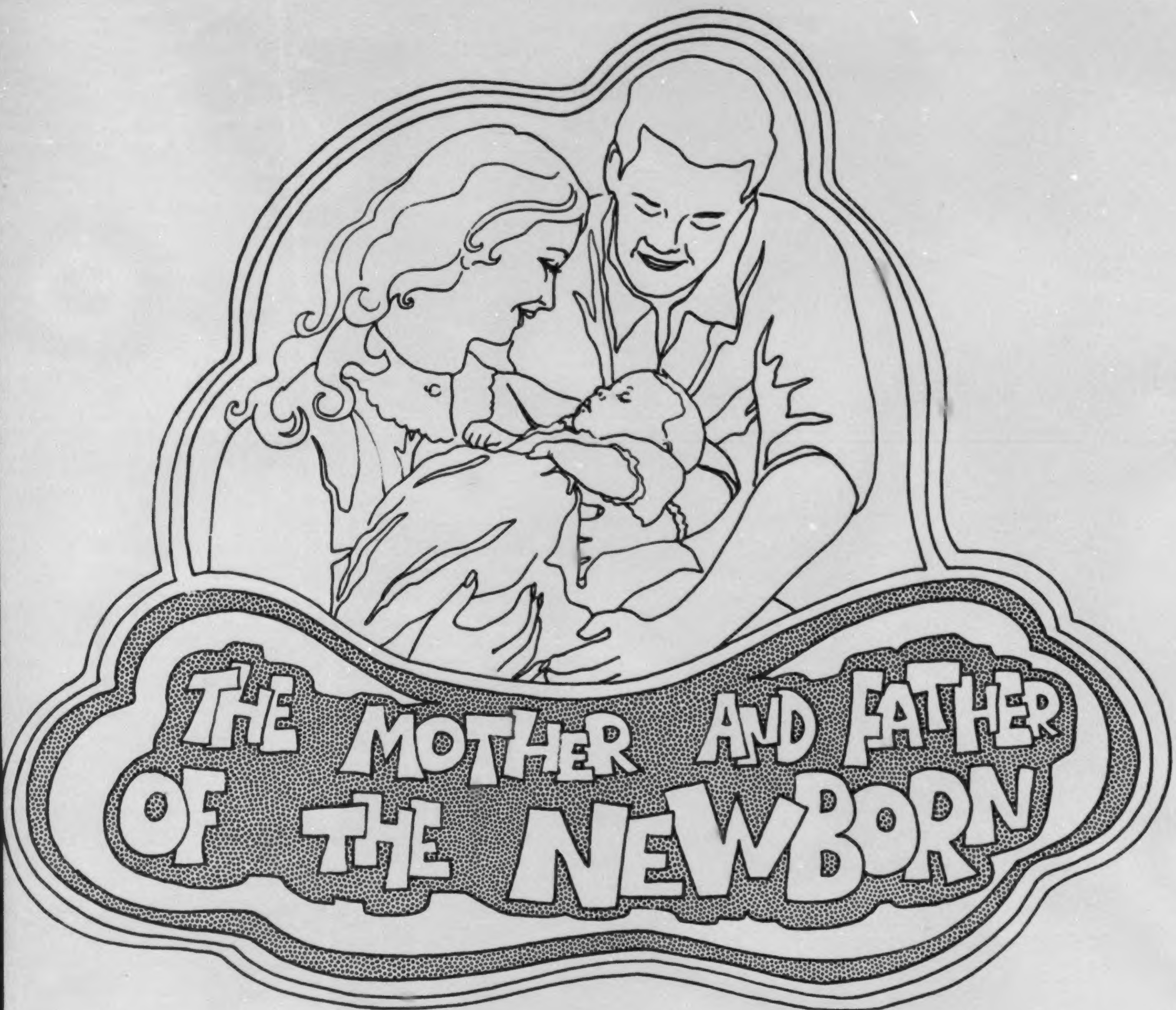

THE MOTHER AND FATHER
OF THE NEWBORN

VII. The Mother and Father of The Newborn

Their Responsibility in The Prevention of Mental Retardation in The Next Generation

Objectives

General

a. The student will know that there are genetic diseases which cause mental retardation that are currently treatable.
b. The student will understand that all newborns must be routinely tested to detect genetic disease.
c. The student will realize that treatment for inborn metabolic disorders must be started very soon after birth to prevent mental retardation.
d. The student will know that extremely special intensive care is necessary for a newborn that has any high risk factor to prevent possible mental retardation.
e. The student will recognize that stillborns or miscarriages are many times caused by a very specific genetic defect.
f. The student will understand that breast feeding an infant has definite psychological advantages for the child.
g. The student will understand that infections, including diarrhea and possible venereal disease, must be promptly and expertly treated in the newborn.
h. The student will understand that jaundice or a yellow tinge to the infant is a danger sign which needs prompt medical diagnosis and treatment.
i. The student will know that it is very important for the mother and father of the newborn to be close to their infant and to have physical contact immediately with the newborn after birth.
j. The student will realize that potential child abuse can be detected during the newborn period and that professional help should be sought immediately.
k. The student will realize that even though they take all or most of their responsibility in the prevention of mental retardation that there is still a possibility that they may have a mentally retarded child.
l. The student will realize that the parents of a retarded child must seek counsel, help, treatment and education immediately for their child.

Specific

Cognitive

1. The student will be able to state two general ways in which genetic diseases are treatable.
2. The student will be able to state approximately how much it costs to screen for seven metabolic errors in one newborn.
3. The student will be able to explain what a metabolic disorder is.
4. The student will be able to state the approximate number of metabolic disorders which cause mental retardation that are currently detectable and treatable.
5. The student will be able to state the percentage of mental retardation caused by metabolic genetic disease.
6. The student will be able to list five broad categories of newborns who would be considered high risk.
7. The student will be able to state why a rapid increase in head size or a lack of increase in head size in the infant are signs that he or she may have a serious disorder.
8. The student will be able to explain how breast feeding protects the newborn from infections.
9. The student will be able to explain how infant diarrhea can result in brain damage.
10. The student will be able to outline two ways in which jaundice can be treated to prevent mental retardation in the newborn.
11. The student will be able to define bonding or imprinting.
12. The student will be able to list two ways in which the potential of child abuse may be prevented during the newborn life of the child.
13. The student will be able to state the percentage of mental retardation for which a cause is unknown.

Affective

1. The student will feel that it is important to screen newborns for genetic disease.
2. The student will feel that with proper treatment some genetic diseases are treatable.
3. The student will feel that undetected and untreated metabolic disease can cause mental retardation.
4. The student will feel that newborns with any unusual conditions, infections or diseases need specialized, intensive care.
5. The student will feel that breast feeding has definite physiological advantages for the newborn.
6. The student will feel that it is important to find out the cause of death of an infant who is miscarried, stillborn or dies soon after birth.
7. The student will feel that any infection that an infant might have must be treated promptly by a physician.
8. The student will feel that jaundice in an infant needs immediate diagnosis and treatment.
9. The student will feel that it is important for an infant and mother (and father) to have physical contact for as long as possible immediately after birth.

10. The student will feel that a potential child abuser needs help immediately after the birth of his or her child.
11. The student will feel that not all mental retardation is preventable.
12. The student will feel that if he or she has a mentally retarded child they should seek immediate advice, treatment and education for that child.

Background Information for the Teacher

THE MYSTERIOUS NEWBORN

"Happy Birthday! How are you?
If you could only tell us how you are.
If you could only tell us how it was to be born.
If you could only tell us how it was in there."

But the helpless newborn infant cannot so the adults in his or her life must figure out those questions for themselves. If the newborn looks damaged, sick or misformed it is evident that either in the infant's formation and growth or birth something has gone wrong. But if he or she appeared to be healthy and whole we must often assume he has weathered creation, life inside and the trip out well. At least 3% of the time this is not the case. It is that 3% we are interested in. The great mystery of whether the newborn is O.K. or not O.K. is often for the adults who care for him or her to figure out.

WHAT ARE WE LOOKING FOR ?

Many factors which can be devastating to the infant do not present any specific evidence as we gaze upon the newborn. The facts can be elusive and unless we detect them they may devastate the body and brain of the newborn as she or he begins their rapid growth.

Mystery #1. If a pregnancy ends in miscarriage, stillbirth or a newborn death the cause of the death is often just given in symptomatic terms.

Prevention: Such events can give us clues as to the risk of such a death, miscarriage or defect happening again in a future child.

Anywhere from 30% to 50% of conceptions end before the parents know that an egg has been fertilized. This happens because the beginning cells had chromosomal abnormality. In miscarriages that last long enough for the mother and father to know conception has taken place studies show that anywhere from 25% to 80% are chromosomally defective.

A chromosome analysis as well as an autopsy should be done for all stillborns or newborn deaths as well as miscarriages. The parents can then be informed of any genetic or other defects which specifically caused the death of the baby or was part of his or her makeup. In this way the rate of a reoccurrence of death or the risk of having a defective child might be predicted.

For both the infant born alive and the infant born dead or miscarried more attention is being given to analyzing the amniotic fluid, placenta, fetal membranes and umbilical cord for clues either to the cause of death or early diagnosis of possible disease in the newborn. Although the afterbirth appears to be an unorganized mass as it is expelled from the mother its function and splendid organization before birth were critical to the life of the infant for nine months. It may hold "secrets" of defects now or to come in the newborn.

Mystery #2. The number of children who are physically abused in the United States per year is 1.6 million. At least 2,000 die each year from child abuse, 60,000 sustain significant injuries and 6,000 have permanent brain damage.

Prevention: There are two things which can be done by the mother and father of the newborn to lessen the likelihood that they will abuse their child. First of all they can make sure that their baby is not separated from the mother and father in those first precious seconds, minutes and hours immediately after birth. It is a time when the infant and parents are bonded together and the infant is imprinted with the mother's and father's face by smell, touch, sound and sight. It is an extremely important time for setting the emotional relationship and feelings of the parents for the child and the child for the parents for the rest of their life. Some researchers even feel that there is something physiological that "happens" at the time of imprinting just as an infant's cry can cause the "physiological happening" of a mother's milk flowing or her uterus contracting.

In animal experiments when a particular auditory stimulus is substituted for the mother or a particular visual stimulus is substituted for the mother immediately after birth the baby animal will follow either the visual or auditory stimulus around even if the real mother has been reintroduced to the baby animal. It accepts the sound or form which it was imprinted with or bonded to immediately after birth and ignores the real mother.

If the mother is heavily medicated the baby will probably be taken from her immediately after birth. Often the father is not allowed to touch and hold the baby until it is taken home. The opportunity for strong imprinting is not optimized. It is known that an infant can make affective and cognitive responses immediately after delivery and that parents seem to function well with one kind of infant and not another.

If a newborn is wrapped in a prewarmed blanket and placed in the mother's and father's arms and they are allowed to hold their newborn for several hours the infant's temperature can remain stable in the recovery room. With an expert staff even the high risk infant can have an opportunity to establish parent-child bonding.

In many hospitals the regular routine inhibits this imprinting response and subsequent nurturing. The first 24 hours are the most critical for establishing normal father-mother-infant bonds.

Another aspect in the prevention of child abuse pertinent to the newborn period is that parents of the newborn must be aware of and learn to recognize signs and feelings of non-acceptance of their child without guilt and supression of these feelings. If both or one of the parents
... are passive in their feelings toward their newborn
... are not interested in or motivated to hold, stroke and gaze upon their newborn
... are disappointed in their infant's looks or sex
... have feelings of hostility towards the newborn
... make negative comments about their newborn
... have been upset with the thoughts of being parents
... feel that this child will be a burden
... are depressed with the child's birth
... considered abortion or adoption for this child
... are not unified in their commitment to the child and its support
... have been an abused child themselves
they should admit such feelings to each other and seek professional help and support by confiding in their doctor, visiting nurse association, mental health organization or child and family welfare agency. This infant and its parents are at high risk. Even though the risk is at onset a mental one it can quickly become a problem of physical abuse and brain damage of the child.

If the mental aspects of high risk newborns were given "equal time" with physiological high risk infants the number of battered and subsequently brain injured children might be reduced by one half.

Mystery #3. About 1% of infant deaths are caused by infection. Infection in the newborn may be caused by:

1. an infection of the mother before birth such as in Herpes Simplex II and Syphilis.
2. an infection contracted during a prolonged labor from the bacteria in the mother's urinary or genital tract.
3. an infection passed to the infant in the birth canal from E. Coli.
4. an infection sustained immediately after birth from the hospital nursery.

The following four infections threaten the integrity of the brain of the newborn.

INTESTINAL INFECTION. In certain areas of the world diarrhea may be the most important preventable cause of mental retardation. In the United States it must also be considered a serious symptom of infection for the newborn. It can be acquired from the newborn nursery or from E. Coli from the mother during delivery.

In diarrhea there is dehydration of the infant with an increase of sodium in the blood resulting in brain shrinkage. Prevention: Prompt and accurate correction of the fluid and electrolyte imbalance and antibiotic therapy is needed to prevent brain damage which results when diarrhea effects the electrolyte balance in the newborn infant.

MENINGITIS. A newborn who is pale, jittery, jaundiced or has a low temperature may have meningitis, an inflammation of the lining of the brain caused by bacteria or viruses. In one out of 2,000 births such an infection is acquired during the birth process. Ten to twenty percent of those infants acquiring meningitis sustain

- brain damage
- mental retardation
- convulsions
- behavior disorders
- deafness.

Prevention: Meningitis although difficult to diagnose and treat adequately to prevent severe brain damage must have prompt and expert medical attention which includes optimal hydration of the infant, antibiotics, reduction of intracranial pressure and management of shock.

ENCEPHALITIS. Encephalitis is a threat to newborns and can result in severe neurological and intellectual defects. Mothers who have Herpes Simplex II before birth or during delivery may infect the child with the disease and subsequent encephalitis.
Prevention: Herpes Simplex may be less devastating when Ara-A (adenine arabinoside) is given at an early date to the infant.

SYPHILIS. Even though a newborn may not have the clinical signs of syphilis at birth it may be dormant within his or her tiny body if exposed to the disease by the mother or father. Syphilis may remain dormant for up to 20 years after infection and emerge with blindness, deafness, disfiguring sores, heart defects, mental retardation, mental illness, nerve damage, paralysis and convulsions.
Prevention: A test for syphilis should be routinely done and treatment with penicillin begun if the infant is infected.

Two general techniques in prevention of infection are important:

1. Newborn cord blood can be used to identify some newborns with infection by testing for elevated levels of immunoglobulin. (The test is not conclusive for 1/3 to 2/3's of infected infants who fail to have an elevated immunoglobulin have an infection in their body.)

2. The colostrum in breastmilk contains antibodies against
   - 3 strains of polio
   - coxsackie B virus
   - two types of colon bacilli which cause infant diarrhea
   - harmful E. Coli
   - gram negative infections.

Because the colostrum contains many protective antibodies the infant should nurse on a demand schedule to build up these antibodies. The advantages to the infant of human milk versus cow milk are
- a prolonged immunity to viruses
- a lower infection incidence
- a lower infant death rate
- a lower incidence of allergies.

Mystery #4. A number of special conditions besides infections may exist which put the newborn at risk.

Prevention: The high risk infant must be identified and treated in a hospital staffed and equipped to meet the needs of a critically ill newborn. Such a staff and equipment can make the difference between life and death, normalcy and mental retardation of the infant. There are many more things that can be done for the newborn at risk than could be done ten or even five years ago but the parents and the infant must be where the knowledge of what to look for, what action to take and the technology to act are available. In turn the staff must be able to educate the parents on how to manage special conditions in their infant as well as being able to treat the newborn.

In general newborn infants at risk include those who:

Have	Are
Any kind of respiratory distress	Less than 5½ pounds at birth
An infection	Small for date of birth
An acid-base imbalance	Post mature
A structural abnormality	Born to a mother having any high risk conditions
Convulsions	Jaundiced: yellow tinge to the skin and whites of the eyes
Sustained injury during birth	
Swallowed their own elimination before birth	

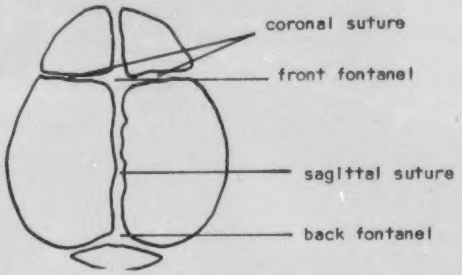
Let's look at what can be done for some of these conditions that put the newborn at risk both physically and mentally.

HYPOGLYCEMIA. Hypoglycemia is a lower than normal amount of glucose (sugar) in the blood of the newborn. It occurs at a rate of 12 per 6,000 births. In one study of 33 infants having convulsions resulting in brain damage 12 or approximately 1/3 of these resulted from lowered blood sugar.

Prevention: Some cases of brain damage in premature infants and infants of diabetic mothers could be prevented by maintaining adequate glucose blood levels in the infant. The physician and parents must be alert to the possibility of hypoglycemia in
- infants born to mothers who have toxemia
- infants born to mothers who are diabetic
- pre and post mature babies
- the smaller of twins
- infants who have not prospered well in the uterus
- infants who have had placental problems.

CRANIOSTENOSIS. The skull is made up of a number of boney plates separated by sutures. See figure 49.

Figure 49 . Boney plates in the skull of the newborn separated by sutures or fontanels.



Craniostenosis is the premature closure of one or more of the sutures and fontanels of the skull. The sutures and fontanels normally do not close until about 18 years of age allowing for brain growth. The head size of the infant doubles by the end of one year and triples by the age of five. Quite clearly the brain needs room to grow and expand the skull with phenomenal speed. Premature closing of one or more of the sutures caused by trauma, infection or genetic defect may alter the head size and/or configuration resulting in mental retardation by compression of the brain.
Prevention: Early detection of any premature suture closure is necessary to prevent irreversible damage to the brain. Routine head measurements should be recorded for all infants during the first year of life as well as testing for movement at the sutures. Any unusual signs such as vomiting, drowsiness and convulsions can be an indication of this condition and they call for a good diagnosis.

Surgical procedures can create sutures to enable the skull to expand and allow for brain growth.

HYDROCEPHALUS. The cerebrospinal fluid bathes the brain and spinal cord. When the cerebrospinal fluid volume increases in the brain from

- over production
- structural blockage
- underabsorption

the fluid is trapped in the skull and expands the boney skull plates and also presses on the brain. This results in subsequent mental retardation ranging from mild to severe and auditory and visual problems. Such a condition can result from genetic defect, infection or birth injury.
Prevention: Routine head measurements should be recorded for all infants during the first year of life. In craniostenosis lack of growth would be noted while growth that is too rapid would be evident in hydrocephalus. Again the unusual signs of drowsiness, vomiting and convulsions can be an indication of this condition. Surgical placement of a tube from the brain to the chest or abdominal cavity to drain off the excess fluid can prevent pressure on the brain and subsequent mental retardation. Early diagnosis and treatment is necessary to prevent brain damage.

KERNICTERUS. Kernicterus or deposits of yellow pigment and lesions in the brain caused by

- a breakdown of the red blood cells
- resulting in bilirubin, one of the by products of red cell breakdown
- bilirubin must be metabolized by the liver and eliminated from the body
- the newborn liver is too immature to handle this fast breakdown of red blood cells, especially the premature liver
- excess bilirubin in the blood is eventually deposited in the brain
- these deposits cause lesions resulting in mental retardation.

Kernicterus can result from a number of conditions in the newborn:

1. Rh incompatibility
2. An inherited red blood cell enzyme deficiency
3. A liver disorder
4. Delayed development of the enzyme metabolizing bilirubin in the liver
5. A hormone in human breast milk which interferes with bilirubin excretion
6. Structural defects in the stomach
7. Drugs given prenatally or during birth and delivery increase the amount of free bilirubin: sulfa, salicylates, antibiotics, heparin
8. Decrease in blood sugar
9. Lack of oxygen.

Besides having many causes Kernicterus has many effects:

1. mental retardation
2. cerebral palsy
3. seizures
4. deafness
5. speech difficulties.

Prevention: A yellow tinge to a baby's skin and whites of the eyes must be taken seriously and as a sign of possible increased bilirubin levels. These levels must be tested over a period of time and be kept within safe levels. Early diagnosis and exchange transfusions can reduce to less than 1% the frequency of Kernicterus among infants with blood incompatibility. Phototherapy, putting an infant under special ultraviolet lights is used to correct jaundice resulting from Rh or ABO blood incompatibility. A baby who is nursing and light treatment fails to lower his or her bilirubin levels may have to be put on formula to keep bilirubin levels within safe limits.

RESPIRATORY DISTRESS SYNDROME. Premature or small for date of birth infants may be born before there is complete lung development. Their lungs may lack a substance that lines or coats the airspaces and is necessary to maintain adequate amounts of oxygen in the lungs. If the capacity of the lungs to oxygenate the blood is decreased brain damage from lack of oxygen can result.
Prevention: Newborns with respiratory distress need intensive care in a special newborn nursery. Babies with this syndrome who have intensive care have a lower incidence of mental retardation and central nervous system damage than infants who survive the syndrome without such special care. Intensive care nurseries

can monitor the oxygen content of blood and give mechanical respiration and circulation support.

Mystery #6. Inborn errors of metabolism are exaggerations of the innate chemical differences that are present in all of us.

About 5% of mental retardation is caused by metabolic disease. In terms of costs metabolic disease is one of the most costly forms of mental retardation to society. Because of just seven of the detectable and treatable metabolic diseases 1,100 babies are born each year potentially in danger. If treatment is not started within a week the results can be devastating to the intelligence of the infant.

The life of all of the cells which make up the body is regulated by enzymes. Thousands of different enzymes are manufactured within a cell and each of those enzymes are responsible for specific chemical reactions and processes. If by genetic determination one or more enzymes within any cell are defective in number or quality a number of things can happen:

1. There may be a toxic accumulation of the unmetabolized substance.
2. There may be a toxic accumulation of an abnormal by-product of metabolism.
3. There may be a deficiency of a substance regulated by enzymes.
4. There may be an overproduction of certain substances by enzyme action.

There are over 400 known inborn errors of metabolism.

Prevention: Some of these 400 metabolic diseases are detectable and treatable. Of those that cause mental retardation screening and treatment could reduce the incidence of mental retardation by 5%. Table 50 summarizes metabolic disorders which cause mental retardation, are detectable by screening and are treatable.

Figure 50 . Newborn errors of metabolism resulting in mental retardation if not screened and treated.

Error of Metabolism	No. of States Screening	Cost per Test	Type of Error	U.S. Incidence Per Year	Population Incidence	Treatment
Galactosemia	8	16¢	carbohydrate	42	1/75,000	Dietary
Maple-syrup Urine Disease	6	16¢	amino acid	15	1/210,000	Dietary
Homocystinuria	7	16¢	amino acid	14	1/225,000	Dietary
Tyrosinemia	4	16¢	amino acid	10	1/315,000	Dietary
Histindinemia	3	16¢	amino acid	131	1/24,045	Dietary
Phenylketonuria	48	50¢	amino acid	273	1/11,538	Dietary
Hypothyroidism	4	30¢	endocrine	630	1/5,000	Thyroid Supplement

Other detectable and treatable metabolic disorders: valinemia, arginosuccinicaciduria, citrullinemia, hyperammonemia.

Consider the economic benefits of a screening program:

- The cost of screening and treatment of the disorders in figure 50 for one year is 27½ million dollars while a lifetime of just routine health care for only these individuals is 516 million.
- In Massachusettes 30 to 35 individuals with inborn errors of amino acid metabolism are detected a year. Ten of these would require institutionalization if undetected and untreated. Screening and treatment costs Massachusettes 1/3 the cost of institutional care.
- Since 1975 Oregon has detected four individuals with hypothyroidism at a savings of more than a million dollars in institutionalization.
- With an expenditure of 30¢ on every newborn in screening for hypothroidism more than 1/4 of a million could be saved every time a child is detected.
- The average cost of treating Phenylketonuria is $1,986 a year. The average cost of treating other metabolic disorders per year is slightly lower. Treatment usually takes place only while the child is young. The average cost of

institutionalization in Indiana for one year for one child is $18,000.
- For a good newborn screening program it takes 40½ million to save 434 million in institutional care!

Early diagnosis and treatment of metabolic disease is critical. It is during the first few months of life that the brain grows most rapidly. To assure optimal intellectual attainment diet or chemical therapy must begin as soon after birth as possible. The test in Figure 50 may be done from drops of blood on a filter paper disc taken from cord blood or blood from the baby's heel. A PKU test must always be followed by a urine test at about 5 to 6 weeks of age. Tests for some of the other metabolic errors also have followup tests. In figure 50 we saw that these inborn errors of metabolism are treated by diet or hormone therapy. Let's take a closer look at these two types of treatment as prototypes of preventable mental retardation.

	Phenylketonuria	Hypothyroidism
CAUSE	An inherited genetic defect.	Rarely inherited. Caused by maternal radiation.
MECHANISM	For protein foods an enzyme in the liver converts one type of protein to another. If this enzyme is defective or absent this conversion is blocked with by-products accumulating. These by-products interfere with normal brain development.	The thyroid gland is non functional or does not excrete sufficient amounts of thyroxin for normal growth and development. Irreversible central nervous system damage can take place by the 3rd month of life.
SIGNS	Not apparent until six months of age.	Not apparent until well beyond three months of age and often not until six years of age.
RESULTS IN	Mental retardation Physical defects Epilepsy Hyperactivity A small brain size Inflammation of the skin	Mental retardation A large head A small body length Wide set eyes Protruding tongue Prominent abdomen
PREVENTION	Newborn screening Restriction of intake of foods containing phenylalanine Eating protein supplements not containing phenylalanine	Newborn screening Thyroxin supplements

Besides screening and treatment to prevent mental retardation caused by inborn errors of metabolism several other preventable measures could be taken.

#1. A newborn could routinely have chromosomal screening to establish any genetic risks it might carry. This information would be a part of the child's personal and medical record and would be of particular importance before the child bearing years.

#2. Metabolic screening results and treatment for any such disorder in the newborn should be a part of the individual's personal and medical records.

#3. Individuals treated for a metabolic disease must be informed of their risks in bearing children. For example, almost all of the offspring of a PKU mother who is not on an appropriate diet during pregnancy may be mentally retarded and/or have congenital malformations.

Pretest

Cognitive

1. Some inborn errors of metabolism which cause mental retardation are treatable by
____ a. diet
____ b. hormone supplements
____ c. both of the above

2. It costs approximately _____ to screen one newborn for seven metabolic errors.
____ a. $100
____ b. $10
____ c. $2

3. An inborn error of metabolism is a defect in one or more __________ of the body cells.
____ a. walls
____ b. enzymes
____ c. protoplasms

4. Approximately ____ treatable inborn errors of metabolism are currently detectable by newborn screening.
____ a. 1
____ b. 9
____ c. 12

5. The percentage of mental retardation caused by metabolic and genetic defect is
____ a. 5%
____ b. 10%
____ c. 15%

6. Newborns who should be considered in need of intensive medical care are those who are
____ a. less than 5½ pounds at birth or have an infection
____ b. having convulsions or are jaundiced
____ c. all of the above

7. An infant's head which does not increase in size at a normal rate could have
____ a. hydrocephaly
____ b. craniostenosis
____ c. both of the above

8. Many conceptions end in miscarriage because of
____ a. malnutrition
____ b. chromosome abnormalities
____ c. drug abuse

9. Approximately ____% of mental retardation is from unknown causes.
____ a. 15
____ b. 25
____ c. 35

10. Immunity to a number of diseases and infections is given to the newborn by
____ a. late clamping
____ b. innoculation
____ c. nursing

11. Diarrhea can cause mental retardation in the newborn by
____ a. brain shrinkage
____ b. convulsions
____ c. both of the above

12. Jaundice in the newborn may be caused by
____ a. Rh incompatibility or an immature liver in the newborn
____ b. a hormone in the breast milk of the mother or drugs given during pregnancy and birth
____ c. all of the above

13. Imprinting is facilitated by
____ a. prolonged contact between the mother and father and infant immediately after birth
____ b. immediate placement of the newborn in intensive care
____ c. both of the above

14. The possibility of child abuse may be lessened by
____ a. parents recognizing feelings of rejection towards their child
____ b. imprinting and parents recognizing feelings of rejection toward their child
____ c. neither of the above

15. Some cases of brain damage can be prevented in infants of diabetic mothers and premature infants by
____ a. preventing toxemia
____ b. stabilizing the acid-base balance
____ c. maintaining adequate glucose in the blood

Key: 1.c, 2.c, 3.b, 4.c, 5.a, 6.c, 7.b, 8.b, 9.b, 10.c, 11.c, 12.c, 13.a, 14.b, 15.c.

Affective

Circle the word or words which best represent your feelings.

1. It is important to screen newborns for inborn errors of metabolism.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

2. Some inborn errors of metabolism can be treated so that the individual will not become mentally retarded.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

3. Intensive care for a newborn with any unusual condition, infection or disease is essential to prevent possible mental retardation.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

4. An autopsy and chromosome study should be done on all stillborn, miscarried or newborn deaths.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

5. Breast feeding provides the newborn with immunity against some diseases and infections.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

6. Some newborn infections can lead to mental retardation in the infant if not promptly and expertly treated.

--	-	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

7. Jaundice must be immediately diagnosed and treated to prevent possible mental retardation in the infant.

-	--	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

8. It is important for the mother and father and infant to have physical contact immediately after birth.

-	--	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

9. Signs of potential child abuse are recognizable soon after the birth of a child.

-	--	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

10. Not all mental retardation is preventable.

-	--	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

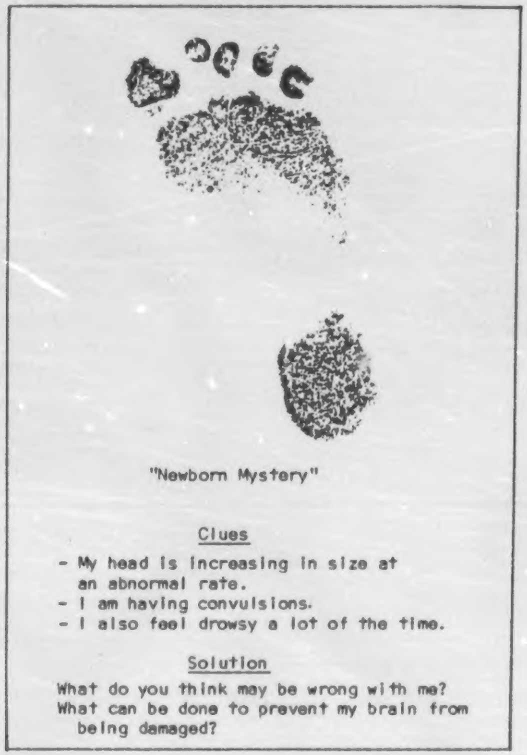
11. Parents of a mentally retarded child need support and counseling immediately after the birth of their child.

-	--	0	+	++
strongly disagree	disagree	neutral	agree	strongly agree

△ A Mini-lecture or Presentation

"A Newborn Mystery"

Give each student or every two students a "Newborn Mystery" as they come into the classroom. (Prepared from dittos 59 through 71 .) A sample ditto is shown below.



"Newborn Mystery"

Clues

- My head is increasing in size at an abnormal rate.
- I am having convulsions.
- I also feel drowsy a lot of the time.

Solution

What do you think may be wrong with me?
What can be done to prevent my brain from being damaged?

One of the first things a mother and father do when they have their baby to themselves after delivery is to unwrap their newborn from his blanket and "count all his fingers and toes" which of course is only an expression for looking at their child to be sure he is alright. What mothers and fathers do instinctively is what needs to be done in a more scientific way to reveal any mysteries that the newborn has within itself. To really "have all their fingers and toes" many things can be done for the newborn to prevent mental retardation as he grows and develops.

Each of you or each set of partners has a "newborn mystery" to solve. During class I will be giving you all kinds of clues which might lead us to suspect that even the perfect looking infant may have some reason for needing special attention immediately as a newborn to prevent retardation as he or she begin their development. In appearance these infants look quite normal. As I go through these clues to the great mystery that the newborn may hold within himself see if you can solve your "newborn mystery". You will have an opportunity to share your solutions with your classmates towards the end of the period.

Clue #1. In miscarriages approximately 23% to 80% of the fetuses are chromosomally defective. To know the risks involved in future childbearing the mother and father of a child who dies in miscarriage, is born dead or dies shortly after birth should request an autopsy and chromosomal analysis to determine the specific cause of death and/or malformation.
Question? What else could be analyzed for clues of abnormal development? An analysis of the amnionic fluid, placenta, fetal membrane and cord for clues as to the cause of death and/or abnormality should also be done. In this way the rate of reoccurrence or the risk of having a defective child might be predicted and the parents can make a more informed decision about future childbearing.

Clue #2. In the United States approximately 6,000 children are permanently brain damaged by child abuse each year. The mother and father of the newborn can do two things during the newborn period which will decrease the possibility that they might become child abusers.

First of all, it is important that the mother and father are not separated from their infant the first few minutes and hours immediately after birth. This is a time which is critical for the infant and its parents to be bonded together in forming emotional relationships and feelings of the parents for the child and the child for the parents for the rest of their lives. This is called imprinting.

Question? What would happen if a mother duck hatched her eggs and then was taken from her babies and a large moving object was placed with the newly hatched ducks?

The ducks would relate to this large moving object as if it was their mother. After a few days if they were given a choice as to what they would follow - the large moving object or the mother duck - they will choose the large moving object to which they were "imprinted" immediately after birth. Some people feel imprinting may even be a physiological process.

If a mother is heavily medicated or if the baby is taken from the mother immediately after birth and the father does not get to hold the baby until it is brought home this strong emotional attachment may not be made between parents and child thus making the possibility of child abuse a greater risk.

Secondly, it is important for the mother and father of the newborn to learn to recognize that they may have feelings of non-acceptance of their child and if they have any of these feelings they should admit them to themselves and each other and seek help in raising their child from medical and social agencies and individuals. If the mother and/or father of the newborn are

- passive in their feelings toward the newborn
- not interested in physical and visual contact with their infant
- disappointed in the infant's looks or sex
- hostile or negative in their feelings toward their infant
- depressed about the child's birth
- considering adoption for the infant, considered abortion during pregnancy or did not want the child
- a child of an abusive parent or parents

the child's risk of being abused is high.

Clue #3. About 1% of infant deaths are caused by infection and others are brain damaged by the complications of infection.

The mother and father of the newborn must be sure that infection in their newborn is treated promptly by a medical staff trained in handling the problems of newborn infants. Four infections particularly threaten the learning potential of a newborn.
Question? What would you guess are four serious infections for the newborn?

1. An infection resulting in diarrhea is not usually thought of as having the potential to cause mental retardation. However, in the under-developed countries of the world infant diarrhea may be the most important preventable cause of mental retardation. U.S. parents must consider it a serious condition in the infant. An infection can be acquired in the newborn nursery or from the mother during delivery. If not treated promptly it can result in dehydration, brain shrinkage and convulsions. Treatment involves balancing fluid and electrolytes within the infant which if not kept within normal limits can damage the brain.

2. Meningitis is an infection which results in inflammation of the lining of the brain. One out of every 2,000 infants acquire meningitis during the birth process and about 10% of these become brain damaged and mentally retarded. The mother and father of the newborn who observe that the infant is pale, jaundiced, cold and jittery should seek expert medical help for their child immediately. To prevent mental retardation in the infant the physician will try to reduce pressure in the infant's brain, prevent dehydration, use antibiotics and prevent or treat shock.

3. Encephalitis is an infection which results in inflammation of the brain. Such inflammation can result in severe intellectual and neurological defects. Encephalitis is a common result of infection of the infant by the venereal disease, Herpes Simplex II, either before or during birth. The mother and father of a newborn who have any possibility of having venereal disease should have their newborn tested for Herpes Simplex. Herpes results in neurological defects in about 80% of infected infants. Although it is not totally treatable a new drug, A-Ara, given at an early date to the infant may lessen neurological damage.

4. Syphilis may manifest no visible signs in the infant. The infection may be transmitted to the infant before or during birth. Laying dormant for as long as 20 years in the child it emerges with a damaging array.

- blindness
- deafness
- disfiguring sores
- heart defects
- mental retardation
- mental illness
- nerve damage
- paralysis
- convulsions

The mother and father of the newborn should have the infant tested for syphilis and treated if there is any possibility that the child could be infected to prevent mental retardation in later years.
Question? What do you suppose a mother can do to protect her child against infections and disease?

Besides specific treatment for the four infections which threaten newborns the mother of a newborn can give the infant protection from her own body against

- 3 strains of polio
- coxsackie B virus
- two types of colon bacilli which can cause fatal diarrhea
- harmful E. Coli
- gram negative infections,

by breast feeding on a demand schedule. The colostrum or first fluid to flow from the breast contains antibodies against these infections. A breast fed infant has a prolonged immunity to viruses and a lower incidence of infections and allergies.

Clue #4. Some newborns are high risk infants.
Question? Who must determine if the newborn is high risk?

The mother and father of the newborn along with the physician determine if there are any high risk factors in relation to the infant needing treatment in a hospital staffed and equipped to meet the needs of its risks. They must ask

Is My Newborn ...
... at risk because I am a mother or father with high risk conditions?
... less than 5½ pounds?
... small for date of birth?
... significantly past the due date?
... manifesting any structural abnormalities?
... having convulsions?
... sustaining birth injuries?
... jaundiced?
... spitting up its own elimination swallowed before birth?

Diagnosis and quality treatment of a high risk infant is important to lessen the possibility of mental retardation. Here are a few things that can put an infant "at risk" but may also be fairly successfully treated if prompt and expert medical care is given.

Hypoglycemia may be a cause of newborn convulsions resulting in brain damage. Convulsions may be due to a lower than normal amount of sugar in the blood which occurs in 12 out of 6,000 births.

If the infant is pre or post mature, small for date of birth or born to a diabetic mother or one who has had toxemia, the physician and parents should be alert to the possibility that the infant's blood sugar should be monitored to prevent convulsions resulting in brain damage.

Craniostenosis results when the boney plates of the skull which are normally separated by sutures and soft spots or fontanels knit together too soon. (Draw the skull of the newborn from figure 49 to illustrate.) This closing process is usually not complete until 18 years of age. If the sutures close early the brain has no room in which to grow. Normally the brain doubles by the end of an infant's first year and triples by age 5. If the boney skull plates cannot expand the brain becomes compressed and misshapen.

The mother and father of the newborn must see that an infant has routine head measurements during the first year of life as well as contacting a doctor about any unusual signs such as vomiting, drowsiness or convulsions. Surgery can be done to create sutures where they have closed too early to allow expansion of the skull during brain growth.

Hydrocephalus occurs when the cerebrospinal fluid which bathes the brain and spinal cord increases in volume due to overproduction, underabsorption or structural blockage causing expansion of the boney skull plates and pressure on the brain. The parents should request routine head measurements during the first year of life and any unusual signs such as vomiting, drowsiness or convulsions should receive immediate medical attention. Early diagnosis of rapid head growth must be made so that treatment can be started which usually consists of surgery to place a tube from the brain to the abdominal or chest cavity to drain off excess cerebrospinal fluid. If done early enough mental retardation may be prevented or lessened.

Kernicterus or the deposit of the yellow pigment bilirubin in the brain is a result of the inability of the infant's immature liver to metabolize one of the components of red blood cell destruction-bilirubin. The excessive bilirubin deposited in the brain can cause brain damage and mental retardation.

Mothers and fathers of a newborn who have Rh incompatibility or whose baby has been born prematurely or small for date of birth must be alert to the possibility of this condition. They should consider jaundice, a yellow tinge to the skin and whites of the eyes, as a danger sign which requires expert diagnosis and treatment to prevent mental retardation. Putting the infant under special light, an exchange transfusion or changing the infant from breast to formula milk are a few of the ways of treating jaundice successfully.

Respiratory Distress Syndrome occurs when an infant lacks a substance that lines or coats the air spaces of the lungs and is necessary for adequate amounts of oxygen in the lungs as the infant exhales. RDS is what caused the death of the newborn son of John F. Kennedy. Premature or small for date of birth babies are sometimes born before lung development is complete. The substance which coats the air spaces of the lungs has not been manufactured yet. If an infant survives RDS the substance that is necessary to coat the air spaces of the lungs to maintain adequate oxygen begins to be manufactured but before that happens the brain may be damaged from lack of oxygen.

The mother and father of a premature infant must be sure that their child receives care in an intensive care nursery with the know how, staff and equipment to handle RDS. With special care the incidence of mental retardation in infants who survive RDS is lower than those without such special care.

Clue #5. Question? If each of us as a newborn baby were to have an extensive analysis of our chemical makeup what do you suppose would be found? It would be found that there are great differences among us. Severe problems are only exaggerations of these differences.

The metabolism of a cell is regulated by thousands of enzymes within each cell and some that operate outside of the cell. If just one of these enzymes is defective a serious defect may occur in the infant. Inborn errors of metabolism are not usually visible in the newborn to the parents or physician. However, at least twelve serious metabolic errors which cause mental retardation are now both detectable and treatable in the newborn infant.

The parents of the newborn should routinely request such screening. If all newborns were screened for metabolic disorders about 5% of all mental retardation caused by genetic and metabolic disease could be prevented. Indiana by law tests newborn for only two metabolic diseases-PKU and Hypothyroidism. If treatment is not started soon after birth for metabolic diseases the result can be a life of mental retardation and other handicaps for the affected individual

The newborn may be screened by obtaining several drops of blood from his or her cord blood or from the heel on a round disc of filter paper. Small circles of dried blood are then punched from this disc to test. Much of the testing can be done by automated machinery.

The total cost for testing for seven metabolic diseases is under $2.00 per newborn. If every newborn were tested, each year 1,115 affected infants could be diagnosed and treated for metabolic disease. The cost of caring for 1/3 (the number who would be severely retarded) of these children in an institution for the retarded for just one year would be approximately $6,690,000. (Based on Indiana costs.) Screening and treatment of inborn errors of metabolism cost approximately 1/3 of what it costs for institutional care.

Lets look at two metabolic diseases which are being screened for by states such as Idaho, Washington, Oregon, Massachusettes and California. Pass out the Phenyketonuria-Hypothyroidism Comparison ditto prepared from ditto 72.

	Phenylketonuria	Hypothyroidism
CAUSE	An inherited genetic defect.	Rarely inherited. Caused by maternal radiation.
MECHANISM	For protein foods an enzyme in the liver converts one type of protein to another. If this enzyme is defective or absent this conversion is blocked with by-products accumulating. These by-products interfere with normal brain development.	The thyroid gland is non functional or does not excrete sufficient amounts of thyroxin for normal growth and development. Irreversible central nervous system damage can take place by the 3rd month of life.
SIGNS	Not apparent until 6 months of age.	Not apparent until well beyond 3 months of age and often not until 6 years of age.
RESULTS IN	Mental retardation Physical defects Epilepsy Hyperactivity A small brain size Inflammation of the skin	Mental retardation A large head A small body length Wide set eyes Protruding tongue Prominent abdomen
PREVENTION	Newborn screening Restriction of intake of foods containing phenylalanine Eating protein supplements not containing phenylalanine	Newborn screening Thyroxin supplements
STATES PRESENTLY SCREENING	48	4
U.S. INCIDENCE PER YEAR	273	630
COST FOR SCREENING	50¢	30¢

Question? What observations, impressions, ideas hit you as you read this? Discuss and clarify this comparison.

"Solutions to the Newborn Mysteries"

Let's sit in a circle so that everyone can see and listen to everyone else as you tell what solutions you reached in your "newborn mystery". Have each student or pair of students give their clues and solutions.

Great, I am sure you can do as well in a real life situation.

TOWARDS PREVENTION

Question? What percentage of mental retardation is from unknown causes?

Twenty five percent. So even if you were able to carry out all of the actions suggested for

- the teenager
- the man and woman
- the man and woman planning for a child
- the pregnant woman and the father
- the woman in labor and birth and the father
- the mother and father of the newborn

there would still be a very small chance of one of those unknown factors causing mental retardation in your child. If this did happen you should seek immediate help in providing expert treatment, care and education for a mentally retarded child to optimize the potential of that special person. However, your chances of having a mentally retarded child would be greatly lessened and you should also feel that you had done everything possible to bring a child into the world who is whole, intact and able to grow and develop with reasonable intelligence.

Work towards the prevention of mental retardation in the next generation. Give your future child or children the Right to Be Born Well.

☐ Classroom Experience Options

1. Show a movie to introduce, clarify or reinforce a concept or feeling:

   a. PKU-Preventable Mental Retardation A-686
   Time: 15 min. color film junior and senior high school
   Content: A discussion of the prevention of mental retardation in certain children by use of a urine test during infancy.
   Available from: ⊛ #10

   b. Lily
   Time: 18 min. color film junior and senior high school
   Content: A film made by a mother about the life of her Down's Syndrome child who is completely integrated into family life and the public school system. A movie of hope.
   Available from: ⊛ #9 Pending Purchase

2. Use pamphlets for discussion or summary:

   a. PKU and Your Newborn Child ⬡ #24

   b. Guarding Your Newborn Child Against Metabolic Disorders ⬡ #24

3. Have several students write the Bureau of the Handicapped and state legislators regarding their feelings about mandatory legislation for newborn screening for metabolic disorders.

4. Invite a pediatrician to speak on newborn screening, caring for the high risk infant, respiratory distress syndrome and/or newborn infections.

5. Have a nurse who teaches prepared parenthood classes talk about imprinting.

6. Invite a mother who has had a prepared birth, nursed her infant and had "rooming in" in the hospital tell of her experiences.

7. Have someone from a local hospital laboratory or the Board of Health demonstrate the procedures in PKU testing.

8. Invite a mother and father of a child with PKU, Hypothyroidism, Craniostenosis or Hydrocephalus to relate their experiences with their child to the class.

9. Have a dietician from a local hospital or school system explain how a PKU infant is treated with a special diet. Have her put together a menu of PKU Diet Foods.

10. Have an emergency room doctor speak on his experiences with child abuse.

11. Invite someone from LaLeche League to speak on the advantages of Breast Feeding.

12. Role play: A mother and father of a newborn feel depressed about the birth of their infant and do not care to hold him. They admit their feelings to each other and they decide what to do.

13. Discuss in small groups:
    a. How important do you think imprinting is?
    b. Do you feel it would be possible for you to abuse a child?
    c. How would you choose a hospital that can handle high risk infants?
    d. Why doesn't Indiana screen for twelve inborn errors of metabolism that are treatable? What could we do about this?

Outside Classroom Experience Options

1. Visit an intensive care nursery and "a rooming in" arrangement for mother and baby at a local hospital.

2. Make a survey of local hospitals to find out what kind of staff and equipment they have to handle high risk newborns.

3. Visit a state hospital or local facility serving mentally retarded individuals. Ask if they have children who have metabolic disease or had a serious infection as a newborn.

4. Visit a laboratory to observe the PKU test being "run".

5. Watch an infant being examined by a pediatrician at a doctor's office or a hospital.

6. Interview a state legislator about their knowledge and feelings on newborn screening for metabolic disorders.

7. Survey the hospitals in your town to find out what types of newborn metabolic screening is being done.

✓ Action Checklist

Pass out the action checklist prepared from ditto 73 as a summary to this unit of study. Encourage their response to this call to action.

MOTHER & FATHER
OF THE
NEWBORN

____ I will request an autopsy and chromosome study on any miscarried, stillborn or newborn dying after birth and be informed of the results.

____ I will hold my newborn immediately after birth for several hours if possible. (Boys! I will remain with my newborn for several hours after birth.)

____ I will be consciously aware of any negative feelings or actions I might have towards my newborn admitting these feelings and attitudes to myself and seek professional help in dealing with these feelings.

____ I will identify with the physician any factors which make my infant a high risk newborn.

____ I will choose a hospital which has excellent intensive care for high risk infants if my infant falls into this category.

____ I will breast feed my baby. (Boys! or encourage the mother of my child to breast feed our baby.)

____ I will have my newborn tested for venereal disease if the possibility of infection exists.

____ If I am a diabetic or have had toxemia during pregnancy or if the baby is pre or post mature or small for date of birth I will request a blood sugar level test for my infant.

____ I will request screening for inborn errors of metabolism for my newborn.

____ I will put the results of metabolic screening in the newborn's personal medical records.

____ I will request our physician to do routine head measurements of my infant for the first year of life.

____ I will seek immediate medical help for any unusual signs in my newborn such as diarrhea, vomiting, convulsions, drowsiness, lowered body temperature or jaundice.

Post Test

Give the same test used in the pretest. Let the students see how many answers that they originally did not know that they can now correct. Use as an in class or homework activity. Determine the individual and class gains.

VII. The Mother and Father of The Newborn

Ditto 59

"Newborn Mystery"

Clues

____ I am very normal looking and acting.

____ I may not have any signs that something is wrong until I am three or maybe even six years old.

____ By that time I will be irreversibly mentally retarded.

____ The necessary treatment to prevent my being mentally retarded is inexpensive.

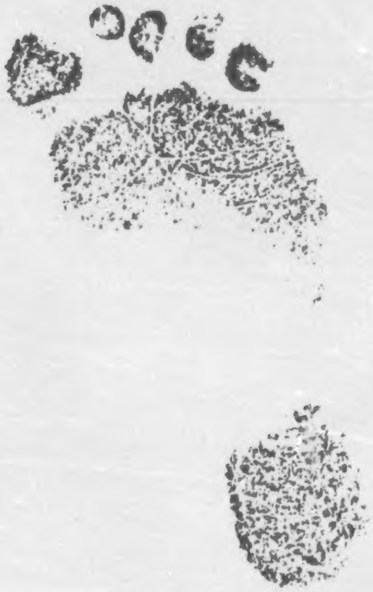
Solutions

What do I have?

How could it have been prevented?

VII. The Mother and Father of The Newborn

Ditto 60



"Newborn Mystery"

Clues

____ I look very normal.

____ Many states test for the condition I have.

____ Proteins are not broken down properly in my body.

____ Some of the byproducts of incorrect metabolism may damage my brain.

Solution

What can be done to prevent me from becoming mentally retarded?

VII. The Mother and Father of The Newborn

Ditto 61

"Newborn Mystery"

Clues

____ I am premature.

____ The oxygen content of my blood is low.

Solution

What do you suspect is wrong with me?

How can my parents see that my chances for becoming mentally retarded are reduced?

VII. The Mother and Father of The Newborn

Ditto 62

"Newborn Mystery"

Clues

____ When I was born I looked pink and healthy.

____ Two days later my eyes and skin have a yellow tinge.

____ Otherwise I look very normal.

Solution

What must my mother and father do to prevent the possibility of my brain being damaged?

VII. The Mother and Father of The Newborn

Ditto 63

"Newborn Mystery"

Clues

____ I am having convulsions.

____ I am also vomiting.

____ My head is not increasing in size at a normal rate of growth.

Solution

What do you think is wrong with me?

How can damage of my brain be prevented?

VII. The Mother and Father of The Newborn

Ditto 64

"Newborn Mystery"

Clues

____ I am a premature infant.

____ My brain has been damaged by seizures.

Solution

How might this damage have been prevented?

VII. The Father and Mother of The Newborn

Ditto 65

"Newborn Mystery"

Clues

____ I look very healthy.

____ I will not become ill and brain damaged until I am 20.

Solution

What do I have?

How can my parents prevent my illness and mental retardation at 20?

VII. The Mother and Father of The Newborn

Ditto 66

Clues

____ I appeared very healthy at birth.

____ Now I have lesions on my skin.

____ I acquired an infection during birth.

____ My brain has an infection.

Solution

What do I have?

How could this infection have been prevented?

VII. The Mother and Father of The Newborn

Ditto 67

"Newborn Mystery"

Clues

____ I appeared to be very healthy at birth.

____ Now I am cold and jittery.

____ I think I acquired an infection being born.

Solution

What must my parents do to prevent or lessen the possibility of my mental retardation?

VII. The Mother and Father of The Newborn

Ditto 68

"Newborn Mystery"

Clues

____ I have a chromosome defect.

____ I was born 6 months early.

____ I did not live.

Solution

How can I play a useful part in the prevention of mental retardation in the future?

VII. The Mother and Father of The Newborn

Ditto 69

"Newborn Mystery"

Clues

____ I caught an infection being born.

____ I have a severe imbalance of electrolytes.

____ Convulsions have injured my brain.

____ My parents didn't think I was seriously ill.

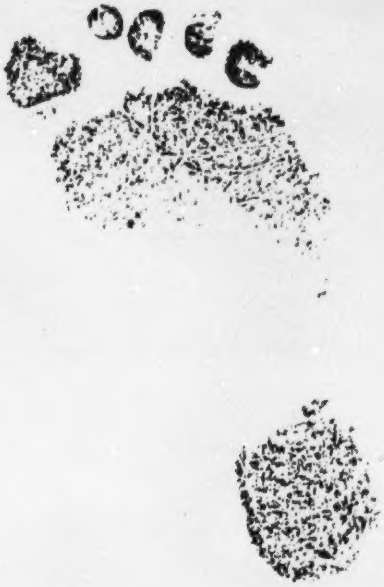
Solution

What do I have?

How could brain damage have been prevented?

VII. The Mother and Father of The Newborn

Ditto 70



"Newborn Mystery"

Clues

____ My mother and father could not hold me until three days after my birth.

____ After they feed me my bottle they immediately put me back to bed.

____ I think my parents are disappointed in the way I look.

Solution

What risks do I have being born under these circumstances?

VII. The Mother and Father of The Newborn

Ditto 71

"Newborn Mystery"

Clues

____ My head is increasing in size at an abnormal rate.

____ I am having convulsions.

____ I also feel drowsy a lot of the time.

Solution

What do you think may be wrong with me?

What can be done to prevent my brain from being damaged?

VII. The Mother and Father of The Newborn

Ditto 72

	Phenylketonuria	Hypothyroidism
CAUSE	An inherited genetic defect.	Rarely inherited. Caused by maternal radiation.
MECHANISM	For protein foods an enzyme in the liver converts one type of protein to another. If this enzyme is defective or absent this conversion is blocked with by-products accumulating. These by-products interfere with normal brain development.	The thyroid gland is non functional or does not excrete sufficient amounts of thyroxin for normal growth and development. Irreversible central nervous system damage can take place by the 3rd month of life.
SIGNS	Not apparent until 6 months of age.	Not apparent until well beyong 3 months of age and often not until 6 years of age.
RESULTS IN	Mental retardation Physical defects Epilepsy Hyperactivity A small brain size Inflammation of the skin	Mental retardation A large head A small body length Wide set eyes Protruding tongue Prominent abdomen
PREVENTION	Newborn screening Restriction of intake of foods containing phenylalanine Eating protein supplements not containing phenylalanine	Newborn screening Thyroxin supplements
STATES PRESENTLY SCREENING	48	4
U.S. INCIDENCE PER YEAR	273	630
COST FOR SCREENING	50¢	30¢

VII. The Mother and Father of The Newborn

Ditto 73

Action Checklist

"The Mother and Father of The Newborn"

____ I will request an autopsy and chromosome study on any miscarried, stillborn or newborn dying after birth and be informed of the results.

____ I will hold my newborn immediately after birth for several hours if possible. (Boys! I will remain with my newborn for several hours after birth.)

____ I will be consciously aware of any negative feelings or actions I might have towards my newborn admitting these feelings and attitudes to myself and seek professional help in dealing with these feelings.

____ I will identify with the physician any factors which make my infant a high risk newborn.

____ I will choose a hospital which has excellent intensive care for high risk infants if my infant falls into this category.

____ I will breast feed my baby. (Boys! or encourage the mother of my child to breast feed our baby.)

____ I will have my newborn tested for venereal disease if the possibility of infection exists.

____ If I am a diabetic or have had toxemia during pregnancy or if the baby is pre or post mature or small for date of birth I will request a blood sugar level test for my infant.

Ditto 73 continued

____ I will request screening for inborn errors of metabolism for my newborn.

____ I will put the results of metabolic screening in the newborn's personal medical records.

____ I will request our physician to do routine head measurements of my infant for the first year of life.

____ I will seek immediate medical help for any unusual signs in my newborn such as diarrhea, vomiting, convulsions, drowsiness, lowered body temperature or jaundice.

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